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ANNUAL SHELLFISH MANAGEMENT REPORT

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by
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INTRODUCTION

The Cook Inlet Management Area, Statistical Area H, is bounded on the east by the longitude of Cape Fairfield (148^0 50' W. long.) and on the south by the latitude of Cape Douglas (58^0 52' N. lat.). The management area is divided into six shellfish districts: Southern, Kamishak, Barren Islands, Outer, Eastern, and Central (Figure 1).

A discrete area, Outer Cook Inlet (Statistical Area G), has been established specifically for the trawl and pot shrimp fisheries in the Outer and Eastern Districts (Figure 2). Area G has its eastern boundary at the longitude of Cape Fairfield and western boundary at a line drawn from the westernmost tip of Point Adam to the westernmost tip of Cape Elizabeth and south along 151^0 53' W. longitude.

This report covers the most recent shellfish fisheries in Cook Inlet: 1995 hardshell clams, 1995 octopus (*Octopus dofleini*), 1995-96 green urchins (*Strongtyocentrotus droebachiensis*), and 1995 razor clams (*Siliqua patula*. The 1995-96 seasons for Tanner crab (*Chionoecetes bairdi*), red king crab (*Paralithodes camtschaticus*), and Area H trawl and pot shrimp fisheries were closed due to low stock abundance. The 1995 weathervane scallop (*Patinopecten caurinus*)fishery was closed in federal waters, but open within state waters. No one fished for scallops in state waters. The 1995-96 fisheries for sea cucumbers (*Parasitichopus californicus*) and Area G pot shrimp were open, but no one made any landings. The catch data from the 1995 Dungeness crab (*Cancer magister*), 1995-96 Area G trawl shrimp, and blue mussel (*Mytilus edulis*) fisheries are confidential. This is due to department policy making catch information confidential when the catch is taken by two or less fishermen. A summary of the Tanner crab, king crab, and shrimp stocks as well as historic fisheries are given in this report. Emergency orders affecting these fisheries are listed on Table 1.

Shellfish landings from the Cook Inlet Management Area (H) included 248,358 lb of razor clams, 71,025 lb of hardshell clams, 3,295 lb of green urchins, and 16,307 lb of octopus. Area G trawl shrimp harvest, blue mussel, and Cook Inlet Dungeness are confidential because 2 or less fishermen participated in the respective fisheries.

The approximate exvessel value by species was $125,000 for razor clams, $12,000 for octopus, $140,000 for hardshell clams (including mussels), $30,000 for trawl shrimp, $4,000 for urchins, and $17,000 for Dungeness. Total estimated exvessel value of all shellfish species for the Cook Inlet Management Area for the 1995-96 seasons was approximately $0.3 million.

TANNER CRAB FISHERY

Introduction

Tanner crab fishing has occurred in 6 of the districts in the Cook Inlet Management Area (H): Southern, Kamishak, Barren Islands, Central, Outer, and Eastern (Figure 1). Historical catch, since inception of the minimum legal size in 1976, has ranged from 285,000 lb in 1994 to 5.7 million lb in 1978-79 (Figure 3 and Appendix A). The number of participating vessels has ranged from 7 in 1990 to 137 in the 1988 season. The entire management area was closed for the 1989, 1995, and 1996 season due to depressed stock conditions.

Average weight per crab from commercial deliveries has varied with time and district. The Southern District has the largest crabs with averages that have ranged from 2.30 to 2.82 lb per crab. The Kamishak and Barren Islands Districts have had the smallest crabs with averages varying from 2.09 to 2.35 lb per crab (Appendix B).

The Southern District is fished by both small and large vessels. The fishery occurs in the relatively protected waters of Kachemak Bay. Approximately 50 percent of the vessels do not

have circulating crab tanks. The Homer and Seldovia boat harbors, home ports to most of the fleet, are no more than a 3 hour run from the geographic extremes of the district. Fishing depths range from 5 to 95 fathoms, but generally are between 30 and 65. Annual harvests have ranged from 270,000 to 2.9 million lb. The fishery was closed in 1989, 1990, 1995 and 1996 due to depressed stock conditions. Recent vessel effort has been high with 136 boats fishing during the 1993 season and 110 boats in both the 1992 and 1994 seasons (Appendix A).

The Kamishak Bay and Barren Islands Districts are often considered one management unit, because survey, fishery, and tag recovery information show that these 2 districts contain a single stock of Tanner crabs. The fishery in the Kamishak and Barren Islands Districts occurs in open waters subject to severe weather and icing conditions, as well as extreme tides and seasonal ice flows from upper Cook Inlet and Kamishak Bay itself. All participating vessels have circulating sea water systems. The smallest vessels are generally 50 ft in keel length. These smaller vessels are often extremely limited in fishing time due to the weather conditions. Many fishermen generally fish around the clock; the boats jog while the gear soaks. Safe anchorage from storms is located behind Augustine Island or in Iniskin Bay. Fishing occurs in a 15 to 90 fathom depth range. Historical catch since full development of the fishery and implementation of the legal minimum size has ranged from 0.4 to 3.3 million lb. The fishery was closed in 1989, and 1992 through 1996 due to depressed stock conditions. Vessel effort has ranged from 7 to 28 boats (Appendix A).

The Outer and Eastern Districts are located in the Gulf of Alaska bordering the Prince William Sound Management Area (Statistical Area E) on the east at Cape Fairfield. Recently this fishery has occurred in or near the mouths of the many fjord like bays along the outer coast of the Kenai Peninsula; however, the exposed open waters in the Gulf of Alaska portion of these districts once provided significant portions of the catch. The fleet in these districts is characterized by both small and large vessels, the smaller boats fishing the bays and the larger vessel fishing both the bays and the open ocean. Poor weather conditions impact all of the boats because the smaller vessels must negotiate open ocean waters to reach gear placed in the bays both east and west of

Seward, which is the delivery point for most of the crabs. Some crabs, however, are delivered to Homer resulting in an equally rough trip from the bays of the outer Kenai Peninsula.

This crab stock has suffered the same severe decline in abundance as the stocks as far east as Yakutat. Historical catch since implementation of the minimum legal size in 1976 has decreased from 800,000 to 50,000 lb. The fishery was closed from 1989 through 1991, and 1993 through 1996 due to depressed stock conditions. Vessel effort has ranged from 7 to 25 boats (Appendix A).

The regulatory season for the entire management area is from January 15 through March 31. The season may be terminated earlier by emergency order. The opening date of January 15 was first implemented in 1987. The season opening was November 1 from the periods 1983 to 1986 and 1972 to 1974. The opening was December 1 from 1974 to 1983. The season for the Southern District fishery may be delayed if weather conditions indicate potential damage to exposed crabs.

In the Southern and Kamishak/Barren Islands Districts the emergency order is utilized to close the fishery once the guideline harvest level is achieved. The Outer and Eastern Districts close based on decline in catch per unit of effort (CPUE), termination of a fixed period of time, or by regulation on March 31.

The Department has tagged Tanner crabs for a number of years in the Southern, Kamishak Bay, and Barren Islands Districts. Thus far there has been no interchange of legal males between the Southern District and the Kamishak/Barren Islands; however, tag recovery has indicated the Kamishak Bay and Barren Islands Districts' Tanner crabs are one stock. Furthermore the legal males tagged in these two districts have been captured in Kodiak's North Mainland Section, but only on a regular basis as far south as Douglas Reef, which is approximately 5 mi south of Cape Douglas (Figure 1).

Regulations distinctive to the Cook Inlet commercial Tanner crab fishery are:

1) Superexclusive registration.

2) Registration prior to the season opening.

3) Gear storage in the Kamishak and Southern Districts in 15 fathoms or less, except in the eastern portion of the Southern District where it is 10 fathoms or less.

4) A 75 pot limit for the entire management area except a 40 pot limit in the Southern District if the district's guideline harvest level is less than 800,000 lb.

5) Buoy identification tags are required to assist with the pot limit enforcement.

6) A requirement for four 4 3/4 in escape rings on all gear.

1996 Season Summary and 1997 Management Outlook

Due to continued low stock abundance the entire Cook Inlet Management Area was not opened to commercial Tanner crab fishing in 1996.

Southern District

The 1995 department Tanner crab trawl survey in the Southern District indicated that recruitment did not justify a commercial harvest for the 1996 season. Recruitment into the legal segment of the stock was 157,000 crabs (Appendix C). The recruits coupled with the 78,000 post recruits yielded a total legal male estimate of 235,000 crabs. Although the preseason adult male (both legal and sublegal) estimate was 447,000 animals, which was above the 395,000 adult male minimum threshold that would justify consideration of a commercial fishery, the subsequent lowest manageable fishing mortality of 100,000 crabs would have dropped the remaining portion of the adult male stock below the threshold. Furthermore, this stock is in a gradual recovering

trend from historic lows. Any fishery management error would negate the recent modest gains that the stock has made.

The 1995 estimate of true prerecruit ones in the Southern District was 386,000 crabs. Although skipmolting occurs in Kachemak Bay Tanner crabs, based on previous survey data, it does not appear that skipmolting is likely to exceed 20 percent of the 1995 estimate. If 1996 recruitment, therefore, equals 300,000 crabs, these animals added to the postrecruits may in themselves justify a commercial fishery in 1997. These data, however, ignore the recent depressed condition of this stock as well as the prerecruit two and smaller crab data which indicates the stock may be recovering, but the recovery is gradual.

Kamishak and Barren Islands Districts

This stock seems to be recovering from historic lows as the 1995 trawl survey catches of all prerecruit ones and twos was the highest since inception of the survey. These data followed similar improvements that were identified by the 1994 survey.

A negative characteristic of the stock of Tanners in the Kamishak/Barren Islands Districts is skipmolting in the prerecruit one size class and, to a lesser extent, the prerecruit two size class. It appears that once these animals skip a molt, the likelihood of them molting again is very small. Therefore, the documented buildup of old shell (skipmolt) crabs will not produce any future recruitment into the fishery, but these animals instead will remain as sublegals until succumbing to natural mortality (Figure 4 and Appendix C). As a result of the aforementioned skipmolting, the 1995 estimate of 733,000 prerecruit ones may fall far short of translating into a 733,000 crab recruitment in 1996 for the 1997 season. The estimated 900,000 true prerecruit ones identified by the 1994 trawl survey produced only 172,000 recruits in 1995. Over time, survey data will allow more precise estimates of skipmolting probability in the sublegal size classes.

Outer and Eastern Districts

Although the Department does not survey in the Outer, Eastern, and Central Districts, stocks here have been depressed similar to those in the adjacent Gulf waters of the Prince William Sound Management Area and Kodiak District. Surveys in the remainder of Cook Inlet, as well as adjacent management areas, Prince William Sound and Kodiak, will continue to be utilized to estimate the conditions of the stocks in the Outer, Eastern, and Central Districts. If 1996 recruitment justifies a commercial fishery in the Kamishak and Barren Islands Districts for 1997, then the Outer and Eastern Districts will likely be opened as well. If this occurs, the fishery will be managed based on a fixed period of time, probably 30 days, as opposed to a harvest guideline, which is the strategy used for districts where trawl surveys generate population estimates. The ultimate season length will depend on catch and effort.

In summation, there is a very limited chance of a 1997 fishery in any of the districts within the Cook Inlet Management Area. All 1996 department surveys from Cook Inlet and adjacent areas will be reviewed prior to final determination of the 1997 season.

KING CRAB FISHERY

Introduction

There are two species of king crabs found in the Cook Inlet Management Area (H), red and brown (Lithodes aequispina). Red is the dominant species with brown found only in a scattered distribution in the outer portion of the management area in the Gulf of Alaska. Most of the red king crab fishery has occurred either in the Southern District or the Kamishak/Barren Islands Districts. Very little catch has come from the Outer District and none has been documented from the Eastern District (Figure 1).

Earliest recorded commercial landings of king crab occurred in 1937 when crabs were canned at a Halibut Cove packing facility. Commercial fishing for this species remained at a relatively low level through the 1940's. By the mid-1950's harvest levels rose to approximately 2.0 million lb per year. During the 1960's fishing expanded to the Kamishak Bay District and boats were harvesting up to 8 million lb per year. In 1964-65 a significant drop in catch occurred in the Kamishak District primarily due to lack of processing facilities in the Seldovia area which was a result of earthquake damage in 1964. From the late 1960's through 1976 the seasonal catches ranged from 2.5 to 4.8 million lb. Since that time catches have generally declined (Figure 5 and Appendix D). The commercial fishery has been closed due to low abundance since the 1981-82 season in the Southern District and the 1983-84 season in the Kamishak/Barren Islands Districts.

The current season opens by regulation on August 1. From 1983 to 1987 the season opening date was July 15. Prior to 1983 the season opened on August 1.

The minimum legal size for all species of king crabs is 7.0 in carapace width with a provision for an 8.0 in season. The 8.0 in season, which may be opened and closed by emergency order, has been in effect since 1976. It was used during the 1976-77 season in all districts and during the 1977-78 season in the Kamishak/Barren Islands Districts only. The 7.0 in minimum legal size has been in effect since 1963.

Cook Inlet is a superexclusive registration area for king crab. The current pot limit is 75 if the management area guideline harvest level is greater than 1.5 million lb. If the guideline is less than 1.5 million, then the pot limit is 40. Similar to the Tanner crab fishery, there is a buoy tag requirement accompanying the pot limit.

1995 Season Summary

Southern District

No king crab harvest has been allowed in the Southern District since the 1981-82 season. Extreme low abundance as well as heavy infestation of egg predators in the female clutches necessitated maximum protection of the stock. Although the incidence of egg parasitism seems to have abated; the overall measurable abundance of king crabs remains very low.

Kamishak Bay and Barren Islands Districts

The Kamishak/Barren Islands Districts were first closed to commercial fishing due to low abundance prior to the 1984-85 season. The commercial fishery has remained closed through 1994.

The 1995 trawl survey catch of king crabs indicated a continued depressed stock. Similar to the Southern District, the stock of king crabs in the Kamishak/Barren Islands Districts was characterized by weak recruitment.

Outer and Eastern Districts

Brown king crabs have never been found in high concentrations in the Outer and Eastern Districts. Regulatory fishing for brown king crabs was authorized, via commissioner's permit, coincidental to the Tanner crab season in the Outer and Eastern Districts in 1988. No catch occurred due to lack of abundance of this species. Two vessels received brown king crab permits incidental to the 1992 commercial Tanner crab fishery in the Outer and Eastern Districts. Neither vessel delivered brown king crabs.

1996 Season Management Outlook

Southern District

The department will conduct its annual Southern District king and Tanner crab trawl survey in August of 1996. It is improbable that the results from this assessment will indicate any significant increase in the legal segment of the stock, thereby justifying opening of the commercial, sport, and personal use fisheries.

Kamishak Bay and Barren Islands Districts

The number of prerecruits caught in recent surveys does not indicate that recruitment will justify an opening of the commercial fishery in 1996. The Department will conduct the 1996 trawl survey in mid June.

There will be no further effort to justify an 8.0 in king crab season as provided for by regulation, because research on the reproductive capabilities of male king crabs, conducted by the Institute of Marine Science in Seward, indicates that the large males are more important to the brood stock than small males. Although large skip molt males may appear to be too old to mate, the only conclusive method to determine breeding capability is examination of the gonads, which can only be achieved by killing the crab.

Outer and Eastern Districts

These districts will remain closed to the harvest of red king crabs until the overall stock in the remainder of the Cook Inlet Management Area recovers. Permits for brown king crab will be issued only if the Tanner crab season is opened.

The condition of the red king crab stock in the Cook Inlet Management Area remains severely depressed. Although the fecundity of the females has improved since the 1980's when parasites

infested the egg masses, the overall number of catchable crabs continues at historic lows. It does not appear that a commercial, sport, or personal use fishery is likely to occur at least for another three to four years, or more.

DUNGENESS CRAB FISHERY

Introduction

The majority of the commercial, sport, and personal use Dungeness crab fishing in Cook Inlet has occurred in the Southern District which includes Kachemak Bay (Figure 1). A small amount of crabs have been harvested in the Central and Kamishak Districts. During the 1960's and early 70's commercial catch and effort were usually not a function of resource abundance; the harvest instead was a result of opportune market conditions created by fluctuation in the catches from the west coast Dungeness crab fisheries.

Although low level, sporadic effort has occurred since statehood, catch and effort first increased significantly in 1978 when 1.2 million lb were taken by 49 vessels. Subsequently favorable market conditions and the need of fishermen to find alternative fisheries have kept effort high. Since 1978 annual harvests have ranged from a low of 29,502 lb in 1990 to a high of 2.1 million lb in 1979. The commercial fishery has been closed in the Southern District from 1991 through 1995 due to low overall abundance. The average annual harvest for the entire management area since 1978 was 1.01 million lb (Figure 6). Effort has ranged from 1 vessel in 1993, 1994, and 1995 to 108 vessels in 1982 (Appendix E). After 1978, 92 percent of the crabs were harvested between the months of June and October, and 59 percent of the annual harvest was taken from the waters east of Homer Spit; however, the proportion changed considerably on an annual basis, which was a result of varying recruitment between the waters east and west of the Spit (Appendix F).

Ninety percent or more of the Dungeness fleet were residents of Kachemak Bay communities of Homer and Seldovia. The fishing vessels were in the 40 ft and less size class. Smaller vessels without circulating tanks generally fished the waters east of Homer Spit while larger vessels with circulating tanks fished the deeper somewhat rougher waters west of the Spit.

The 1994 Board of Fisheries substantially changed the regulatory structure used to manage the Southern District as well as the remainder of the Cook Inlet Management Area commercial Dungeness crab fishery. A summary of these regulations is as follows:

1) The Southern District was divided into 2 subdistricts: Subdistrict 1 which includes the waters east of Homer Spit, and Subdistrict 2 which includes the waters west of Homer Spit.

2) Commercial fishing seasons and depth limitations for the Southern District as follows:

   A) Subdistrict 1 is open August 1 through August 31 in waters of 10 fathoms or less only.

   B) Subdistrict 2 is open from July 15 through August 31 in waters of 40 fathoms or less only.

3) The season for the remaining districts of the Cook Inlet Management Area is June 1 through December 31, and from January 15, or the beginning of the commercial Tanner crab season, whichever is later, through March 15.

4) Pot limits with a buoy tag and color code requirement were established as follows:

   A) Southern District: 150 pots.

1) Subdistrict 1: 50 pots, which are included in the overall district limit of 150 pots.

5) Dungeness crab line cannot be floating on the water surface unless it is the line connecting the main buoy to the auxiliary buoy.

Statewide biological regulations for the commercial Dungeness fisheries consist of a males only harvest and a minimum legal size of 6.5 in carapace width. Gear regulations include a provision for two 4 3/8 in escape rings per pot and a biodegradable twine escape mechanism.

Historically the Cook Inlet Dungeness fishery evolved into a summer event for the following reasons:

1) Salmon fishermen are occupied with salmon fishing, thus creating a niche for fishermen who do not hold permits for limited entry fisheries.

2) The weather is better.

3) The catcher/seller sales to the tourist industry are at their peak.

4) Recruitment (the molt) occurs.

Some level of fishing had occurred throughout the year. Catch and effort, however, increase significantly after the major molt, which provides new recruit crabs. The period of significant molting for adult males in Kachemak Bay can occur from late April through mid-September in any given year although the peak months are June and July. The molt is stimulated by water temperature and physiological condition of the crabs. The inconsistency in molt timing between years is partially explained by the significant annual spring-summer temperature variation in the shallower north temperate and subarctic waters of Alaska.

Within Kachemak Bay itself, molting generally occurs somewhat earlier in the waters east of Homer Spit than in the waters west of the Spit where the influence of Cook Inlet proper is much greater. Newly molted legal crabs are often caught east of Homer Spit one month or more before appearing in the gear west of the Spit. Crabs east of Homer Spit are most likely resident from the first post-larval instar up to legal size. Those legal crabs captured west of the Spit, however, may actually be reared as juveniles in the waters of Cook Inlet north of Anchor Point. Catches of small crabs by upper Cook Inlet salmon set netters and casual observations of molted exoskeletons by the general public indicate significant numbers of Dungeness reside in upper Cook Inlet.

Outside of natural population fluctuations, three fishing related factors have had a notable negative impact on this fishery:

1) Depression of the stock due to handling and trapping mortality that was the result of fishing during and immediately after the molting period.

2) Extremely high effort and resultant high annual fishing mortality due to ease of access by both commercial and recreational fishermen.

3) Violation of the 150 pot limit by a portion of the fleet.

The combination of extended heavy fishing pressure and fishing during and immediately after the major molting period for adult males has played the most significant part in the recent sharp decline in the Dungeness crab harvest. Mortalities associated with handling and trapping may not have been significant during the 1960's and early 70's when effort levels were low and stock abundance was high; however, since then the level of fishing accelerated not only in amount of vessels and pots, but also in the amount of time each year that the gear was deployed.

In 1990 the department began a survey to further document the molt timing of the catchable Dungeness crabs and to establish an index of abundance. This survey in tandem with the crab

trawl survey indicated one or two significant year classes moving toward the fishery. Although these animals appear numerous, particularly when compared to the surrounding weak year classes, the following must be weighed when considering the magnitude of this group of crabs: 1) the crabs were only located in the portion of Kachemak Bay east of Homer Spit, and 2) they exhibited an extremely high level (approximately 50 percent) of skipmolting in 1992, 1993, and 1994, the years when they should have fully recruited into the fishery and provided significant numbers of both recruits and postrecruits available for harvest. These animals are now passing through the end of their life cycle as evidence by both a decline in the department's survey catches and harvest by recreational fishermen.

1995 Season Summary

The commercial fishery was not opened in the Southern District (Kachemak Bay) in 1995 due to: 1) a relatively low number of legal males, and 2) the necessity to protect the remaining non-legal catchable crabs in the district from handling and trapping mortality.

Two fishermen delivered crabs from the Central District which is north of Anchor Point. The catch data are confidential. This district is difficult to fish with pots because of the Cook Inlet outflow which results both in rapid siltation of the gear and the lengthy daily period of time that the buoys are submerged. Furthermore, it does not appear that substantial numbers of legal males inhabit this district even during past years of high commercial catch in the Southern District. Within the past 25 years, the largest documented harvest in the management area outside of the Southern District was 43,000 lb in 1988. The 117,000 lb in 1966 was apparently a one time event from the Kamishak District (Appendix E).

Limited entry was adopted into the Cook Inlet Management Area Commercial Dungeness Fishery in 1993. The limit was set at 103 pot fishermen and 2 ring net fishermen. Limiting entry to this large number of participants will be of no inseason management value.

1996 Management Outlook

The department plans to begin the next annual Dungeness pot survey in late May 1996. The survey will be conducted on a monthly basis through August. The commercial fishery will remain closed until department surveys signify that sufficient recruitment into the adult and legal segments of the stock has occurred.

The commercial season in the remaining districts of the management area will be open in 1996. The only district likely to see any effort is the Central District which is in central Cook Inlet north of the Southern District.

AREA H TRAWL SHRIMP FISHERY

Introduction

Cook Inlet is separated into two shrimp registration areas: Area H, which includes the Southern, Kamishak, and Barren Islands Districts; and Area G, which includes the Outer and Eastern Districts (Figure 2).

All of the commercial trawl shrimp fisheries in Area H have occurred in the Southern District. Harvests reached the 5 million lb level in the late 1960's and remained near that point through the early 1980's (Figure 7 and Appendix G). Low stock abundance resulted in partial closures of the fishery during the mid-1980's and total closure beginning in the fall of 1986. Effort has varied from a low of one vessel during 1968 to a high of 23 in 1981. Prior to 1983, most commercial fishing occurred west of Homer Spit, but between 1983 and 1986 virtually all effort shifted to the area east of Homer Spit. The fishery has been closed from 1986 through 1995.

The Southern District (Kachemak Bay) trawl shrimp fishery is characterized by superexclusive registration and management under the Kachemak Bay Trawl Shrimp Management Plan. This plan has three basic features:

1) An annual guideline harvest level determined from stock assessment surveys.

2) Annual harvest spread out over the entire fishing season utilizing 3 separate regulatory sub-seasons.

3) Subseason harvest spread out in equal weekly guideline harvests.

Also, 2 areas are closed to trawl shrimp fishing: the first includes the majority of upper Kachemak Bay east of Homer Spit, originally established because this area consistently contained small, juvenile pink shrimp; the second includes Tutka Bay and Sadie Cove, established because the area encompassed by these bays lent itself to the potential of overharvest.

Pink shrimp (Pandalus borealis) historically made up the bulk of the commercial harvest, with sidestripes (Pandalopsis dispar) seasonally making up a smaller but often significant portion of the catch. Humpy shrimp (Pandalus goniurus) have at times comprised up to half of the harvest, but this species appears to undergo erratic population fluctuations; contributions to the most recent fisheries have been negligible. Coonstripe shrimp (P. hypsinotus) consistently made up less than 5 percent of the catch.

Trawl shrimp surveys have been conducted in Kachemak Bay since 1971. These surveys, which determine each season's guideline harvest level, have indicated significant declines in abundance and distribution of all pandalid shrimp stocks in Kachemak Bay since the late 1970's (Figure 8). These declines led to the aforementioned commercial closures from 1986 to 1995.

1995-96 Season Summary

The fishery remained closed for the 1995-96 season based on the results of the 1995 department trawl shrimp survey. The 120,000 lb population estimate generated by the 1993 survey documented the smallest population of pandalid shrimp since the inception of the survey. The 1995 survey results indicated a slight increase in abundance to 446,000 lb of pandalids. To put these survey data into perspective: the commercial fishery averaged over 5 million lb annual harvest during its peak; the 1995 population estimate of 446,000 lb is 9 percent of that peak which represents the commercial catch only. Despite some shift in size composition and distribution, all information collected during this survey indicated that the stocks remained depressed by historical standards.

1996-97 Management Outlook

The department will conduct the next Southern District trawl shrimp survey during May-June, 1997. The data from the 1995 survey clearly indicate that there is no opportunity for a large increase in recruitment in 1996; therefore, justifying a commercial fishery. As a result, the 1995 survey will likely be used to warrant the commercial closure.

AREA G TRAWL SHRIMP FISHERY

Introduction

Statistical Area G is a nonexclusive shrimp registration area encompassing the Outer and Eastern Districts of Cook Inlet (Figure 2). The first year of significant harvest occurred in the 1982-83 season when 4 vessels caught 239,584 lb (Figure 9 and Appendix H). The catch increased steadily for the next 2 seasons to a peak harvest of just under 2.0 million lb taken by 11 vessels

during the 1984-85 season. Before 1992, pink shrimp comprised 90 percent of the harvests; the remaining 10 percent was sidestripes. Trawl CPUE was never high, rarely approaching 1,000 lb per hour. Logbook information collected over time indicates that fishermen in Area G made long tows, often with extremely low catch results. From 1992 through 1995 the delivered catch was comprised entirely of sidestripes as the vessels targeted on these more valuable animals. Once again, long tows and low CPUE were characteristic of this fishery.

Prior to 1985, the season for shrimp trawling in Area G was open year-round. A regulatory season, beginning June 1 and ending February 28, was adopted by the Board of Fisheries for Area G in the spring of 1985.

1995-96 Season Summary

The Area G season opened by regulation on June 1, 1995. The Eastern District closed by emergency order on December 31, 1995. The Outer District closed by regulation on February 28, 1996. The catch from the Eastern district is confidential due to participation by 2 or less fishermen. The Eastern District was closed because of a decline in commercial catch per unit of effort from previous seasons and achievement of a harvest guideline based on data collected from a department trawl survey. No documented catch or effort occurred in the Outer District.

1996-97 Management Outlook

Initial guideline harvest levels for the 1996-97 season will be set from 0 to 100,000 lb per district, or 0 to 200,000 lb for Area G. Natural and fishery induced fluctuations in sidestripe stock abundance remain poorly understood in the Outer and Eastern Districts. The presence of small shrimp in the bycatch from the 1994 fishery indicated an opportunity for recruitment in 1995. Based on the catch and effort in 1996, the anticipated magnitude of recruitment did not-occur. Recruitment, however, assumes substantial growth and survival, at this time, two unknown factors. The guideline harvest range will therefore again be set broadly at 0 to 100,000

lb per district. Fishery performance and dockside samples will again be significant factors in determining the status of the stock and ultimate management.

AREA H POT SHRIMP FISHERY

Introduction

Similar to trawl shrimp, the Cook Inlet Management Area is separated into 2 distinct registration areas for the pot shrimp fishery: Area H, consisting of the Southern, Kamishak, and Barren Islands Districts; and Area G, consisting of the Outer and Eastern Districts (Figure 2). Historically the major pot shrimp fishery occurred in the Southern District.

Commercial catch figures show that the fishery suffered steep declines in annual harvest until the closure in 1988 (Figure 10 and Appendix I). Pot shrimp fishing in Kachemak Bay was primarily undertaken by small vessel fishermen that develop their own markets. The target species is the coonstripe shrimp, the most abundant pot caught shrimp in Kachemak Bay. Spot shrimp (Pandalus platyceros) also occur in the bay but their contribution to the fishery is generally negligible. Each regulatory fishing season, which began June 1 and ended March 31, was managed via 3 separate subseasons with appropriate guideline harvest levels set for each subseason.

Prior to 1986, guideline harvest levels were determined by the Department's two annual pot shrimp surveys as well as by voluntary commercial fishery performance information. All pot shrimp surveys were subsequently eliminated in the Cook Inlet Area. Fishery performance data in the form of voluntary logbooks were collected consistently during 1986 and 1987 and were the sole criteria used to judge stock status during those years. The department trawl surveys and information from local personal use fishermen continued to indicate that stock of coonstripe

shrimp in Kachemak Bay was depressed. The fishery has been closed to commercial harvest since 1988.

1995-96 Season Summary

To determine the status of the coonstripe shrimp stock the department relies on data obtained from the trawl shrimp surveys and voluntary information from personal use fishermen. The 1995 trawl survey indicated a population estimate of less than 4,000 lb of coonstripe shrimp for Kachemak Bay. These results showed a depressed stock when compared to historical survey catches that generated population estimates up to 1.0 million lb. Furthermore, voluntary information offered by personal use fishermen since 1988 has indicated very poor catches when compared to historical averages.

The aforementioned trawl survey and personal use fishery information demonstrated that the coonstripe stock in Kachemak Bay remained depressed, therefore, the fishery was closed by emergency order for the 1995-96 season.

1996-97 Management Outlook

All information collected during 1993, 1994, and 1995 indicated that stocks of pandalid shrimp continue to be depressed in Kachemak Bay. The fishery, therefore, will remain closed for the entire 1996-97 fishing season in order to promote growth, recruitment, and reproduction in the coonstripe shrimp stock.

AREA G POT SHRIMP FISHERY

Introduction

Similar to the trawl shrimp fishery, Statistical Area G, or Outer Cook Inlet, includes the Outer and Eastern Districts (Figure 2). Currently there are neither season restrictions nor biological regulations governing the pot shrimp fishery. The target species is the spot shrimp; coonstripes and pinks are harvested to a lesser extent. Spot shrimp have comprised 57 to 94 percent of the catch averaging 83 percent. Since 1977 catch and effort have remained low, never exceeding a reported annual harvest of 20,500 lb whole shrimp caught by 8 participating vessels in 1989 (Figure 11 and Appendix J). Despite the extensive coastal area, historical information collected from this fishery indicates that the measurable stocks of spot and coonstripe shrimp occur within some (but not all) bays and are of limited abundance.

1995 Season Summary

The commercial season was open by regulation for the entire 1995 calendar year. No commercial landings were reported. This was likely a function of both lack of shrimp in easily accessible areas as well as lack of interest from the few fishermen who utilize Area G pot shrimp as a small supplement to their income. An interview with a single commercial fishermen, who has participated in this fishery, confirmed this reasoning.

1996 Management Outlook

The fishery will open by regulation. Fish ticket and voluntary fisherman interview information are the only sources of data used to evaluate the Area G pot shrimp fishery. This information will be evaluated inseason to determine if any restrictive management action is necessary.

Effective January 1, 1996, all commercial pots were required to be partly covered by rigid mesh, which must have 7/8ths inch minimum diameter openings. This regulation was designed to reduce handling of small non-marketable shrimp thereby decreasing avoidable fishing mortality. Similar regulations are utilized in the Prince William Sound Management Area, Southeast Region, and State of Washington.

SCALLOP FISHERY

Introduction

The commercial scallop fishery in the Cook Inlet Management Area (H) began in 1983. The target species for the fishery is the Pacific weathervane scallop (Patinopecten caurinus). In 1983 and 1984 the Alaska Board of Fisheries responded to a public proposal by directing the department to allow restricted exploratory fisheries for scallops. These initial fisheries were characterized by low effort due to severe permit restrictions when compared with traditional scallop fisheries both inside and outside Alaska. The most important restrictions were:

1) Legal gear limited to a 6 foot wide dredge with minimum ring size of 4 inches inside diameter.

2) Only 1 unit of gear allowed on board at any one time.

3) Mandatory log book completion.

4) Contact with the Homer office prior to and at the completion of each trip.

5) An agreement to carry department observers on board if requested.

Except for some brief exploratory fishing elsewhere in the Kamishak District in 1984 and in the Outer District in 1987, a single bed of scallops near Augustine Island in the Kamishak District has sustained almost the entire harvest since the fishery began in 1983 (Figure 1). Using the state research vessel Pandalus, the department conducted an assessment survey in August, 1984 to define the extent of this particular bed and to aid in establishing appropriate harvest levels.

Based on information from the 1984 survey as well as data from the initial fisheries, the 1985 Board of Fisheries adopted regulations for scallops in Cook Inlet. These regulations included a season in the Kamishak District from August 15 through October 31, a guideline harvest level of 10,000 to 20,000 lb (changed to 0 to 20,000 lb in 1994) of shucked meats, and the restrictions mentioned previously (except for the single unit of gear provision). Commercial fishery performance has been used inseason to adjust guideline harvest levels. Historic harvest and effort peaked fishery during 1994 when 4 vessels took 20,431 lb of shucked meats (Figure 12 and Appendix K).

By regulation the Southern District was not open to scallop fishing in order to protect crab stocks, while the Outer and Eastern Districts were opened year round to encourage exploratory fishing.

In 1987 review of inseason fishery performance data clearly demonstrated that the Kamishak District stock had taken an unexpected decline. Substantial undocumented information indicated that the Kamishak scallop bed had been fished illegally between the 1986 and 1987 seasons. Regardless of the reason for the sharp decline in abundance, the department closed the fishery.

No commercial effort occurred in Cook Inlet from 1988 through 1992. Although some local fishermen expressed interest in fishing during these years, the potential of a fishery closure after 1 trip did not warrant the investment in time and effort because the department told fishermen that their catch data would be used to justify continuance of the fishery. Fishermen speculated that the probability of good catches were low. Information required from the fishermen would have included logbooks, shell samples, interviews, and a potential for observers.

In 1993 the fishery was essentially redeveloped when a single fishermen took a chance and began fishing the Kamishak District scallops. After his initial trip it was apparent that the stock had recovered to near historic levels. Two other boats joined the fishery before the season was over. The resultant catch was 20,115 lb. Logbooks and shell samples indicated a small but healthy stock of weathervane scallops once again existed near Augustine Island.

1995 Season Summary

In early 1995 a single vessel commercially fished scallops in a venture that was illegal by state law. This occurred in federal waters off Kayak Island (adjacent to the Prince William Sound Management Area) and resulted in the closure of all commercial scallop fisheries in federal waters. Virtually the entire stock of scallops in the Kamishak District resides in federal waters. Although state waters opened by regulation on August 15, 1995, no one fished as fishermen did not want to waste their time in an area where few scallops existed.

1996 Management Outlook

It appears that the state and federal regulatory problems, that provided a loophole for illegal fishing, have been resolved. The Kamishak District fishery, in both state and federal waters, will likely open by regulation on August 15, 1996. It appears that management of the fishery will be by the state with consent from the federal government. The harvest guideline, however, will be set based on the results of a department dredge survey that will occur in July 1996. It seems likely that the data should justify a harvest guideline of 20,000 lb or more because of the size and age structure of the stock coupled with no fishing mortality in 1995.

The scallop fishery in the Outer and Eastern Districts will be managed by regulation, which includes a requirement for an observer. The department does not anticipate significant effort or catch from these districts because exploratory fishing by 2 large commercial scallopers in 1994 yielded a catch of 11 scallops.

HARDSHELL CLAMS AND MUSSELS

Introduction

Documented commercial hardshell clam and mussel harvests in the Cook Inlet Management Area began in 1986. The generic term, hardshell clams, generally refers to littleneck (*Protothaca staminea*) and butter clams (*Saxidomus giganteus*). From 1986 through 1995, the annual harvest of hardshell clams has ranged from 14,500 lb to 71,025 lb. In 1989 the bulk of the clam harvest went to sea otter food for a rehabilitation project resulting from the Exxon Valdez oil spill. In the remaining years the majority of the harvest was Pacific littleneck clams that went to Kenai Peninsula and Anchorage markets. Effort has ranged from 2 to 33 hand diggers (Figure 13 and Appendix L). The entire documented commercial harvest was taken from Kachemak Bay (Figure 1).

Before harvesting clams or mussels for human consumption, an area must be certified for water quality by the Alaska Department of Environmental Conservation (DEC) in accordance with the National Shellfish Sanitation Program. DEC must also check for paralytic shellfish poisoning (PSP). Lot sampling was the method that DEC utilized to check for PSP. In 1986 DEC permitted the use of lot sampling for Chugachik Island (near Bear Cove) in Kachemak Bay. Through 1989, Chugachik Island, Halibut Cove Lagoon, Kasitsna Bay, and Jakalof Bay, all in Kachemak Bay, were certified for lot sampling. At the end of 1989 Tutka Bay was also certified by DEC. The most recent certification occurred in 1994 when DEC departed from the lot sampling strategy and in an all encompassing move approved all the Southern District hardshell clam subdistricts on the south side of Kachemak Bay essentially between Bradley River and Barabara Point (Figure 14).

Only 102 lb of blue mussels were commercially harvested prior to 1989. Annual mussel harvest rarely exceeds 1,000 to 2,000 lb. In 1989, however, the catch rose to over 167,000 lb. The mussels were utilized for food in an otter rehabilitation project which was a result of the Exxon Valdez oil spill (Appendix M).

Prior to 1994 Board of Fisheries action, regulations for the Kachemak Bay hard shell clam fishery were minimal. Minimum sizes were established by the Board in 1990 for Pacific little neck clams at 1.5 in and butter clams at 2.5 in.

In 1994 the department developed a management strategy via proposals to the Board of Fisheries that looked to long term sustainable use of the hard shell clam resource in Kachemak Bay. Key to the management plan was an alternate year commercial harvest strategy which opens half of the certified beaches on 1 year, and the other half during the following year. Other features of the plan included the following commercial restrictions:

1) areas of high recreational value will be closed,

2) weekends will be closed from May 15 through September 15, and

3) a registration deadline of April 1.

The board adopted this plan which served to spread the catch and effort over a larger area, allow for a year of unfished growth and recruitment, provide noninvasive recreational opportunity, and permit the department to anticipate effort.

The plan also included regulations which affected the recreational users:

1) a minimum legal size for littleneck and butter clams of 1.5 and 2.5 in shell length, respectively (both of these are the same as the commercial size limits), and

2) a bag and possession limit of 1,000 littleneck clams and 700 butter clams.

These recreational fishery regulations reduced waste of the resource, aided in maintenance of the reproductive segment of the stock, and most importantly allowed for enforcement of commercial closures.

1995 Season Summary

Total 1995 hardshell clam harvest was 71,025 lb hand dug by 21 permit holders. Littlenecks comprised 94 percent of the hardshell catch at 66,723 lb. Butter clams and cockles made up the remainder of the catch at 4,267 and 35 lb, respectively (Table 2).

The open subdistricts were 1 and 3b, which included significant clam beaches in Bear Cove, the south and west sides of Sadie Cove, and the north side of Tutka Bay. Chugachik Island and the eastern half of Bear Cove were closed by emergency order before the season opened. Chugachick was closed because of reduced clam abundance as identified by the department abundance survey. The eastern half of Bear Cove was closed because of political pressure. On February 23 the western half of Bear Cove was closed by emergency order after 25,000 lb were harvested. This was done in order to spread the catch and effort throughout the remainder of the open subdistricts and reduce the probability of overfishing in Bear Cove. The same emergency order was also utilized to close the commercial clam fishery for the first 15 days of each month. This was done to spread the catch over a greater period of time, thereby allowing the department to respond to conservation issues and to help the industry by providing clams for a greater part of the year. The season ultimately closed by emergency order on June 1, 1995, because the 65,000 lb littleneck guideline was taken.

Blue mussel harvest for 1995 is confidential because only one blue mussel permit holder made commercial deliveries.

1996 Management Outlook

Subdistricts 2, 3a, and 4 will be open for the 1996 season. This includes the heretofore commercially undug beaches on the north and east side of Sadie Cove as well as Peterson and China Poot Bays. The initial guideline harvest will be 65,000 lb of littlenecks. The guideline will be equally divided into 4 quarter of 16,500 lb each and harvested via quarterly periods for the year. Similar to the 15 day monthly closure strategy employed in 1995, this will be done to spread the catch over a greater period of time, thereby allowing the department to respond to conservation issues and to help the industry by providing clams for a greater part of the year. The department will monitor the fishery via fish tickets, logbooks, and abundance surveys.

SEA URCHINS

Introduction

The green sea urchin, the smallest of the commercial urchins, is the only urchin species in Cook Inlet which occurs in quantities sufficient to support a commercial fishery. Green urchins, and commercial fisheries for them, occur along the U.S. and Canadian coasts including the Province of British Columbia, the Maritime Provinces of Eastern Canada and the States of Maine and Alaska. Fisheries also occur in the north temperate and subarctic waters of Europe including the Soviet Union. Green urchins are harvested solely for their gonads, considered a delicacy in the orient.

Although red urchins (*Strongylocentrotus franciscanus*) do occur in small, isolated beds within the Cook Inlet Management Area, their sparse abundance and distribution does not justify a commercial fishery; therefore, no permits are issued.

No commercial harvest for green urchins occurred in Cook Inlet prior to 1987. From 1988 to 1992 the harvest ranged from 224 to 20,445 lb of whole urchins. Catch and effort surged during the 1993-94 season when 195,403 lb were taken by 29 divers (Figure 15 and Appendix N).

By regulation each fisherman must obtain a miscellaneous species permit prior to harvesting urchins commercially. An additional regulatory requirement limits allowable methods of harvest to hand picking or the use of an abalone iron, both intended to minimize disruption of the substrate. Utilizing available published information on this species as well as the framework of past management practices for the red urchin in southeast Alaska, the department established the following permit restrictions for green urchin harvest within Cook Inlet:

1) A minimum legal size of 2.0 in measured across the test, which does not include the spines. The minimum size is intended to protect the broodstock and sufficient numbers of large urchins, which in turn may provide a canopy that helps protect the smaller urchins.

2) Permit duration from mid-September through mid-December, the time period when the gonads may be at their fullest and therefore of highest market quality. The permit period may be extended past mid-December if recovery data are made available to the department.

3) Alternate year harvest strategy between that portion of Kachemak Bay east of Homer Spit and that portion west of the Spit, in order to reduce the probability of a recruits only fishery.

Although the historical harvest database is composed of only 7 years, an alternate year pulse in catch can be detected. The years of low harvest or no effort are the result of the alternate year closure that includes China Poot Bay, which up to this point is the most productive bay for commercial quality green urchins in Cook Inlet. It also appears that the urchins are capable of larger sizes in China Poot.

To this point, logistics and abundance have played a significant role in determining location of urchin harvest. Virtually all the fishing effort and all the reported harvest have come from Kachemak Bay. Because the season occurs during the fall/winter storm months, harvesting among the bays of the outer coast presents not only problems for the divers themselves, but also creates difficulty getting the urchins to market regularly. Timing of delivery to the processor is important because urchin buyers are very particular regarding both recovery percentage and overall quality. A recent low level of effort, however, has not indicated any substantial urchin resource in the outer coast of the Kenai Peninsula.

1995-96 Season Summary

The area east of Homer Spit, including China Poot Bay, was scheduled to be opened for the 1995-96 permit season. This year the department utilized a permit season that allowed for direct input from the commercial divers and processors in order to set the opening when recovery of most of the urchins was near optimal. Once this industry generated figure was achieved, permits were to be issued for three day open fishing periods per week. This would allow the department ample time to collect logbooks, fish tickets, conduct interviews, and sample the landings. Catch, catch per unit of effort, distribution of effort, and spawning condition would determine the termination of permits (season closure).

The abovementioned system was made difficult because of differences of opinion among divers on condition and abundance of the urchins. As a result the department took the most conservative route utilizing information from only the most experienced divers and buyers, ignoring the inflated claims of abundance and condition from those few divers whose observations differed from the majority.

As the result of observations made by most divers, including those with the largest historical harvests, the department did not include China Poot Bay in the area opened by permit. Most of the subsequent effort was focused on upper Kachemak Bay from Bear Cove to Peterson Bay with no effort in the remainder of the management area.

The only buyer interested in providing the department with recovery data indicated that the urchins were in a high quality condition justifying a 3 day opening beginning December 1. Due to both weather and low price, only 994 lb were delivered for the subsequent 12/1-4 or 12/8-11 open periods. The harvest for the 12/15-18 period was 2,301 lb. This was the last open period as the department stopped issuing permits because of low reported abundance. The total season's harvest was 3,295 lb taken by 9 divers.

Although a few divers made exploratory efforts for urchins outside of Kachemak Bay, no deliveries were made as abundance was extremely low.

1996-97 Management Outlook

The season will open by permit no earlier than December 1. This is the date that the department has proposed to the 1997 Board of Fisheries for consideration as a regulatory opening of the urchin fishery within Kachemak Bay. That portion of Kachemak Bay east of Homer Spit will not open. The remainder of the bay as well as the remainder of the Cook Inlet Management Area will open. Significant densities of urchins were identified during 1994 in both Tutka Bay and Sadie Cove. These urchins, however, were less than 2 inches in test width. If these urchins have subsequently grown as growth data published in the literature indicates, a commercial fishery may develop. If they have not because of either genetic, density dependent, or other biological reasons, then the fishery will likely be characterized by meaningful effort but little actual harvest. In any event, the fishery will be managed via permit, opening December 1 for single 3 day periods each week. Fish ticket, logbook, and interview information will determine the development of the 1996-97 fishery.

SEA CUCUMBERS

Introduction

Prior to 1990, the Cook Inlet Management Area had no documented harvest history of the sea cucumbers. In 1990, 2 divers harvested 22,525 lb of cucumbers. The entire catch was taken from Sadie Cove in Kachemak Bay. Although there was sporadic effort with no catch from 1991 and 1992, the next commercial harvest did not occur until fall of 1993. The department began managing the fishery via a permit season (10/1-04/30) in 1993-94 (Appendix O).

No information is available regarding the extent, distribution, or life history of this species in the management area. No regulations or harvest guidelines specific to the commercial harvest of cucumbers are in effect for Cook Inlet. In the absence of biological information, the limited fishery for this species has been managed via miscellaneous species permit. The major provisions of the permit are mandatory logbooks, time, and area restrictions.

Although sea cucumbers have been reported throughout Cook Inlet, particularly within Kachemak Bay, the limited commercial harvest as well as exploratory effort indicate that the stocks are neither dense nor extensive. There is another genus of sea cucumber, Cucumaria sp., which exists in noticeable abundance in portions of the management area. This animal however is of no commercial value.

1995-96 Season Summary

The 1995-96 cucumber permit period extended from October 1, 1995 to April 30, 1996. As part of the alternate year harvest strategy, the department did not include either Tutka Bay or Sadie Cove on the permits. Although 8 permits were issued for sea cucumbers, no catch was reported. Interviews with divers indicated that very limited quantities characterized by sparse distribution

were found within Kachemak Bay. Two divers made very limited exploratory dives in the bays of the outer Kenai Peninsula. Similar to attempts in previous years, they found no cucumbers.

1996-97 Management Outlook

The fishery will be managed by permit provisions again for the 1996-97 season. Except for Tutka Bay and Sadie Cove, the season dates will be October 1 through April 30 unless closed earlier by emergency order. Factors that will be considered in justifying a closure will include catch, effort, distribution of catch and effort, and catch per unit of effort.

This season is the scheduled alternate year for opening the fishery in Tutka Bay and Sadie Cove. The same weekly 3 day harvest period strategy will be used for cucumbers in Tutka and Sadie that was employed for urchins in Kachemak Bay: beginning on or after October 1, the fishery will be opened by permit for a 3 day period per week. Diver interviews, logbooks, and fish tickets will be reviewed to determine progress of the fishery. The upper harvest limit will be 15,000 lb cumulative for both bays. This figure is 50 percent of the historical high harvest for these bays.

OCTOPUS

Introduction

The harvest of octopus in the Cook Inlet area has historically occurred incidentally to other directed fisheries such as the commercial Tanner crab, groundfish pot, longline, and trawl fisheries. Cook Inlet octopus harvest records are currently available since 1983. Catches have ranged from 435 to 48,000 lb with effort fluctuating from 8 to 41 boats (Appendix P). The catch from the high harvest years was the result of bycatch from groundfish fisheries. In the past 5

years increased interest has occurred in directing effort specifically towards octopus. Many different gear types have been tried but the resultant harvest has been negligible. Most of the effort has focused on Kachemak Bay.

There are no closed seasons or size limits for octopus at the present time, but a miscellaneous species permit is required prior to fishing a given registration area. Cook Inlet permit restrictions include short permit duration (typically one to four months), specific reporting requirements, and a detailed description of gear to be utilized. This last requirement prevents use of king, Tanner, Dungeness, or shrimp pots in order to reduce or eliminate the probability of bycatch of those species.

1995 Season Summary

Directed fishing by 6 fishermen resulted in a catch of 1,594 lb taken entirely within the waters of Kachemak Bay. Bycatch and effort from the 1995 groundfish fishery was 10,899 from 11 vessels making 65 landings for directed groundfish fisheries, mostly Pacific cod caught in pot and on longline gear.

1996 Management Outlook

The high prices paid for octopus in recent years, publications promoting the potential octopus fishery in Alaska, and the attraction of an alternative fishery are all expected to produce a continued interest in octopus as a target species during 1996. Interest in the fishery will likely be somewhat tempered by the lack of substantial success by efforts in previous years.

The extent of this resource in Cook Inlet outside Kachemak Bay is undetermined and could ultimately affect any directed fishery. In the absence of an effective method of harvest, the Cook Inlet octopus catch is not expected to increase significantly in 1996 unless it is a result of bycatch from a groundfish pot or longline fishery.

RAZOR CLAMS

-Note- The razor clam chapter of this report is a contribution of Jeff Fox, Soldotna Office, CFM&D Division, ADF&G.

Historically the Cook Inlet Razor clam fishery on the west side of Cook Inlet has been confined to the area between Crescent River and Redoubt Point. All clams harvested in this area are directed by regulation to be sold for human consumption, except for the small percentage (less than 10%) of broken clams which may be sold for bait. Razor clams are present throughout this area with especially dense concentrations in the Polly Creek and Crescent River areas. Beginning in 1993 the Department of Environmental Conservation certified additional area for human consumption, north of the existing Polly Creek certified beach, to Redoubt Creek. In 1994 this certification was extended north to Harriet Point. In the remainder of the Upper Cook Inlet Management Area there are no restrictions on the amount of clams that can be sold for bait. Currently there is no directed effort to harvest Razor clams for the bait market. The minimum legal size for Razor clams is four and one-half inches (114mm) in shell length.

The 1995 fishery began on May 25 and the last reported deliveries were made on August 15. The season's harvest taken primarily from the Polly Creek/Crescent River area was 248,358 pounds (Appendix Q). A total of 23 diggers made 1,320 landings over the course of the season. Diggers were paid an average of $.50 per pound for their harvest making the total exvessel value $125,000.

Table 1. Numeric listing of commercial shellfish emergency orders, issued for the Cook Inlet Management Area for the 1995 and 1995-96 seasons.

Emergency Order Number	Effective Date	Explanation
2-S-H-01-95		Listed in 1994-95 Shellfish Annual Management Report.
2-S-H-02-95	02/23/95	Closed hardshell clam and mussels in specific areas for specific times in the Southern District.
2-S-H-03-95	06/01/95	Closed the clam and mussel season in the entire Southern District
2-S-H-04-95	06/01/95	Closed the pot shrimp fishery in the Southern District.
2-S-H-05-95	07/01/95	Closed the trawl shrimp fishery in the southern District.
2-S-H-06-95	07/15/95	Closed the Dungeness crab fishery in the Southern District.
2-S-H-07-95	09/01/95	Closed the king crab fishery in the Cook Inlet Management Area.
2-S-H-08-95	12/31/95	Closed the trawl shrimp fishery in the Eastern District.

Table 2 . Hardshell clam harvest (pounds) by statistical area, Cook Inlet Management Area, 1995.

District	Stat. sub-area	No. diggers	No. landings	Butter	Little-Neck	Total Hardshall
Southern	241-14	15	52	62	32,063	32,125
	241-16	18	53	4,205	34,660	38,865
	Total	21	93	4,267	66,723	71,025 [1]

Statistical sub-area 241-14 includes Bear Cove.

Statistical sub-area 241-16 includes Sadie Cove and Tutka Bay.

1/Includes 35 lb cockles.

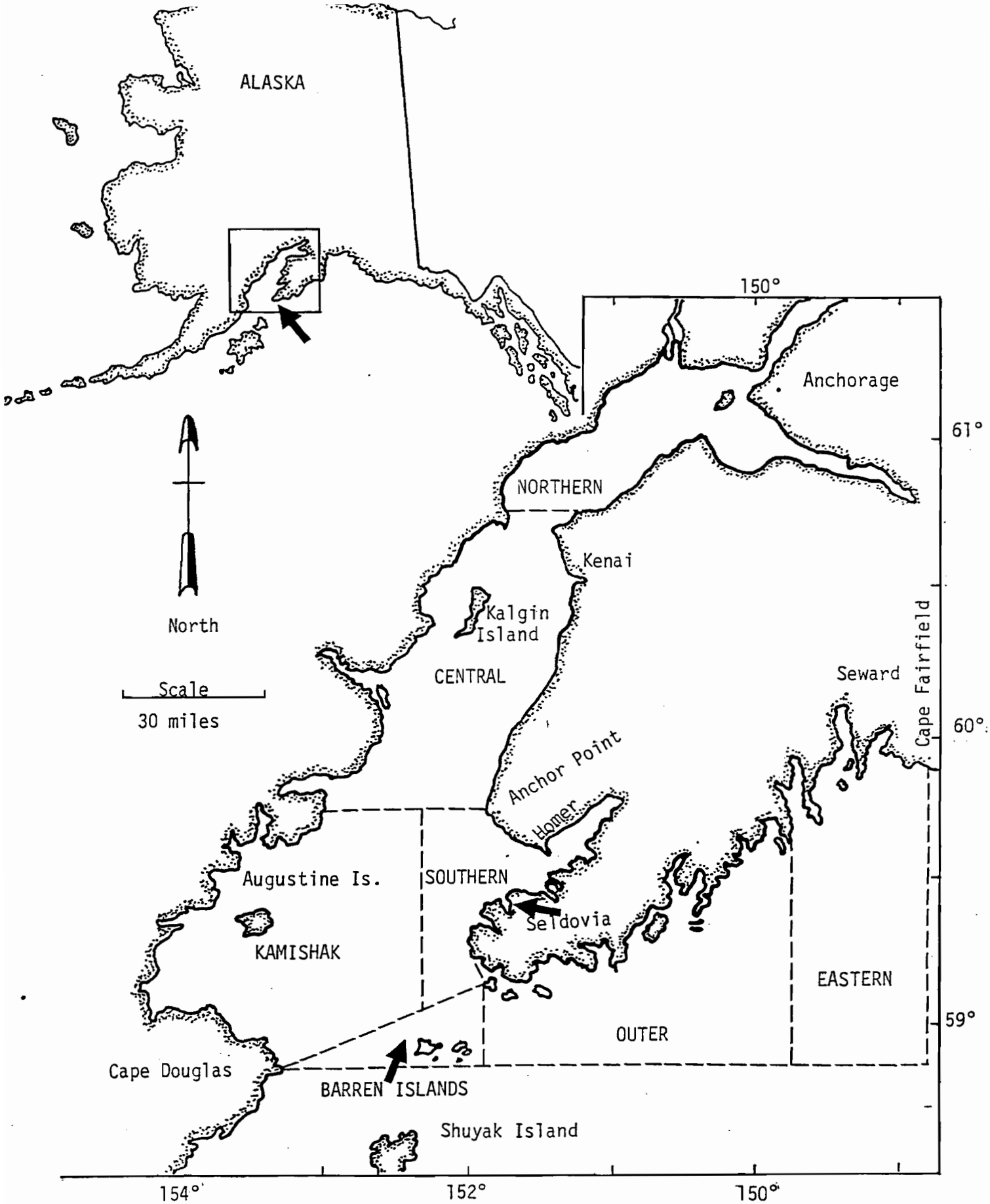

Figure 1. Cook Inlet Management Area.

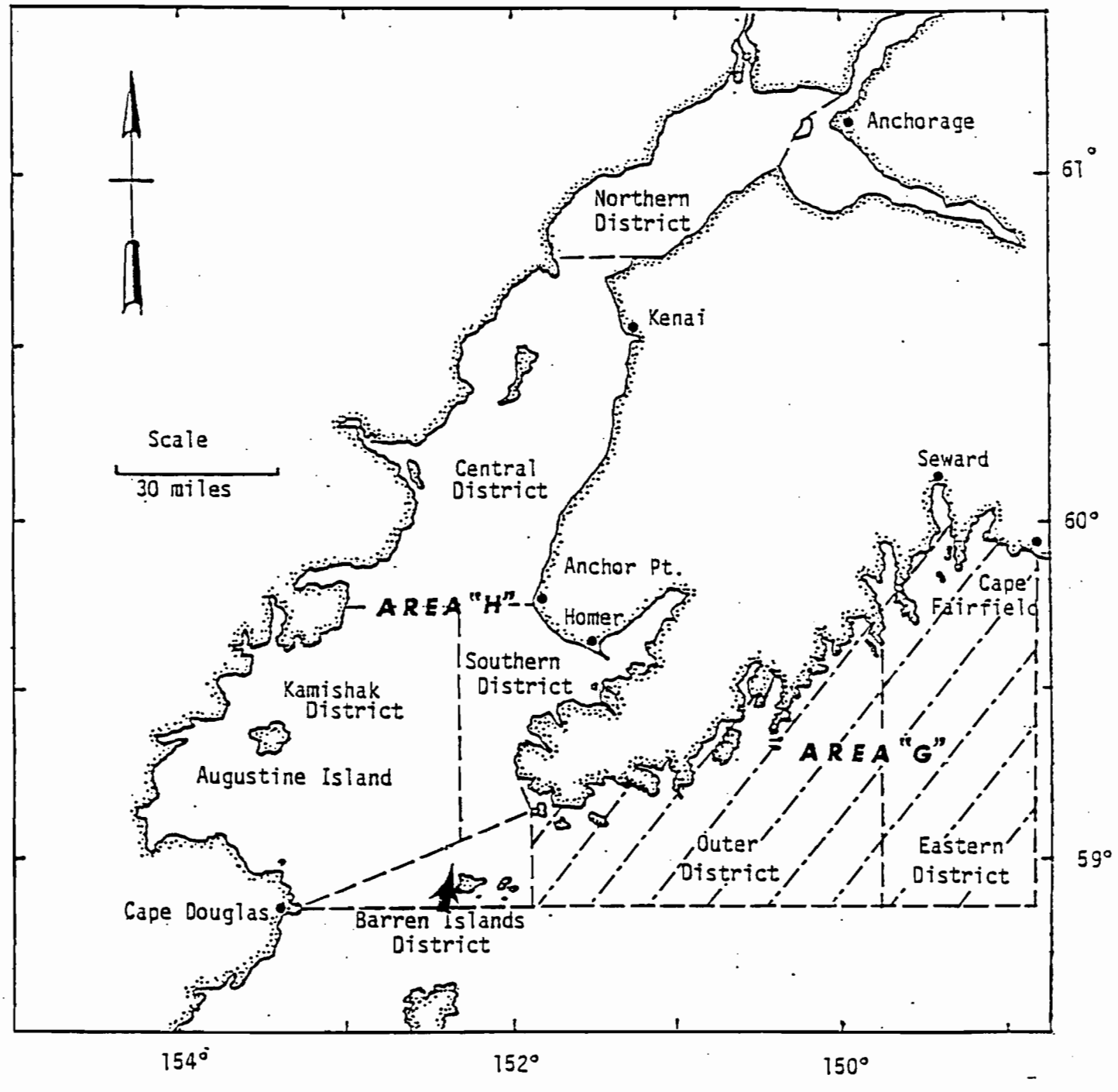

Figure 2. Cook Inlet Area ("H") and Outer Cook Inlet Area ("G") district location chart for shrimp management.

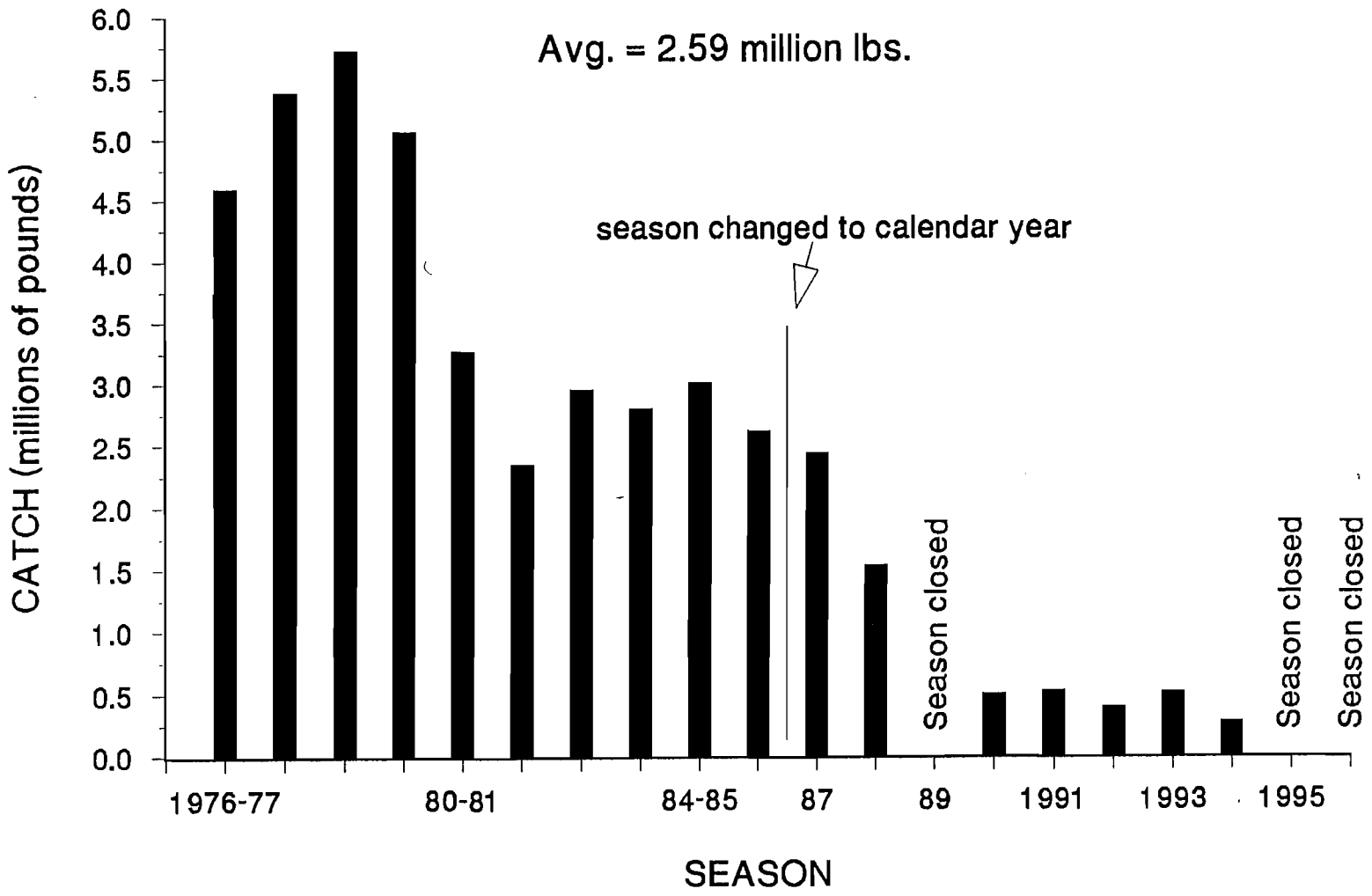

Figure 3. Tanner crab catch by season, Cook Inlet Mgt. Area, 1976 - 1996.

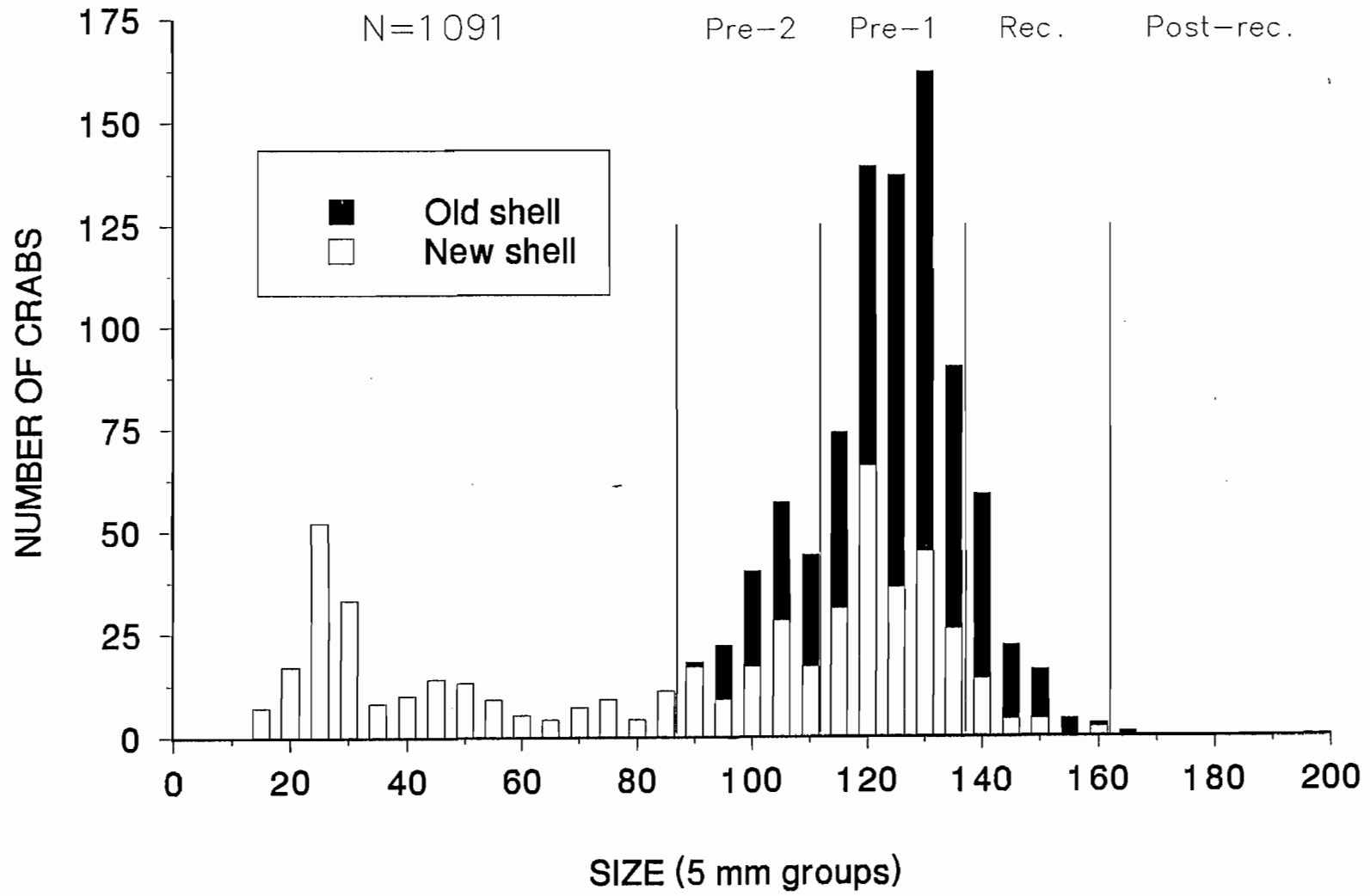

Figure 4. Male Tanner crab catch, Kamishak District, 1996 Cook Inlet trawl survey.

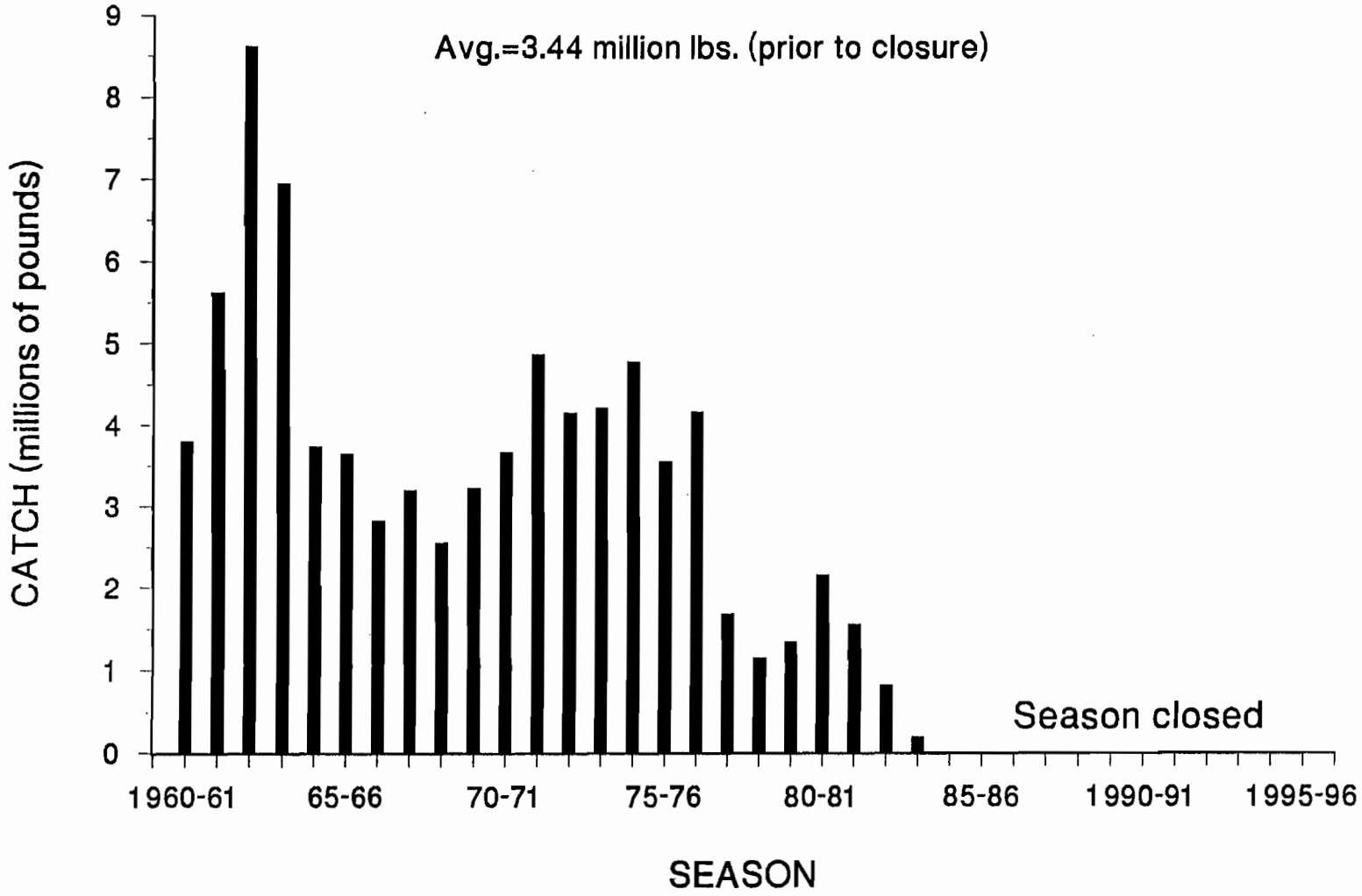

Figure 5. King crab catch by season, Cook Inlet Mgt. Area, 1960 - 1995.

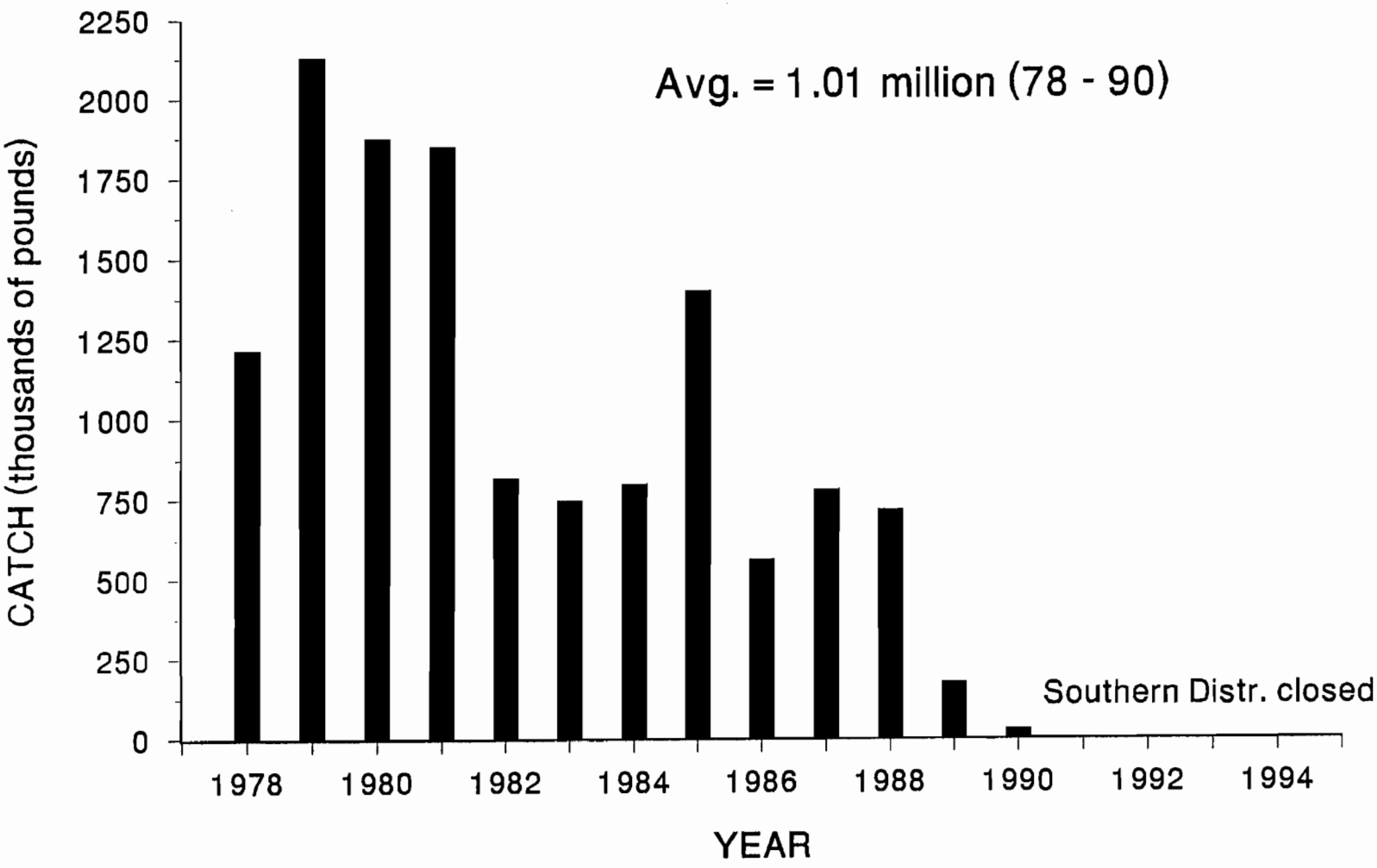

Figure 6. Dungeness crab catch by year, Cook Inlet Mgt. Area, 1978 - 1995

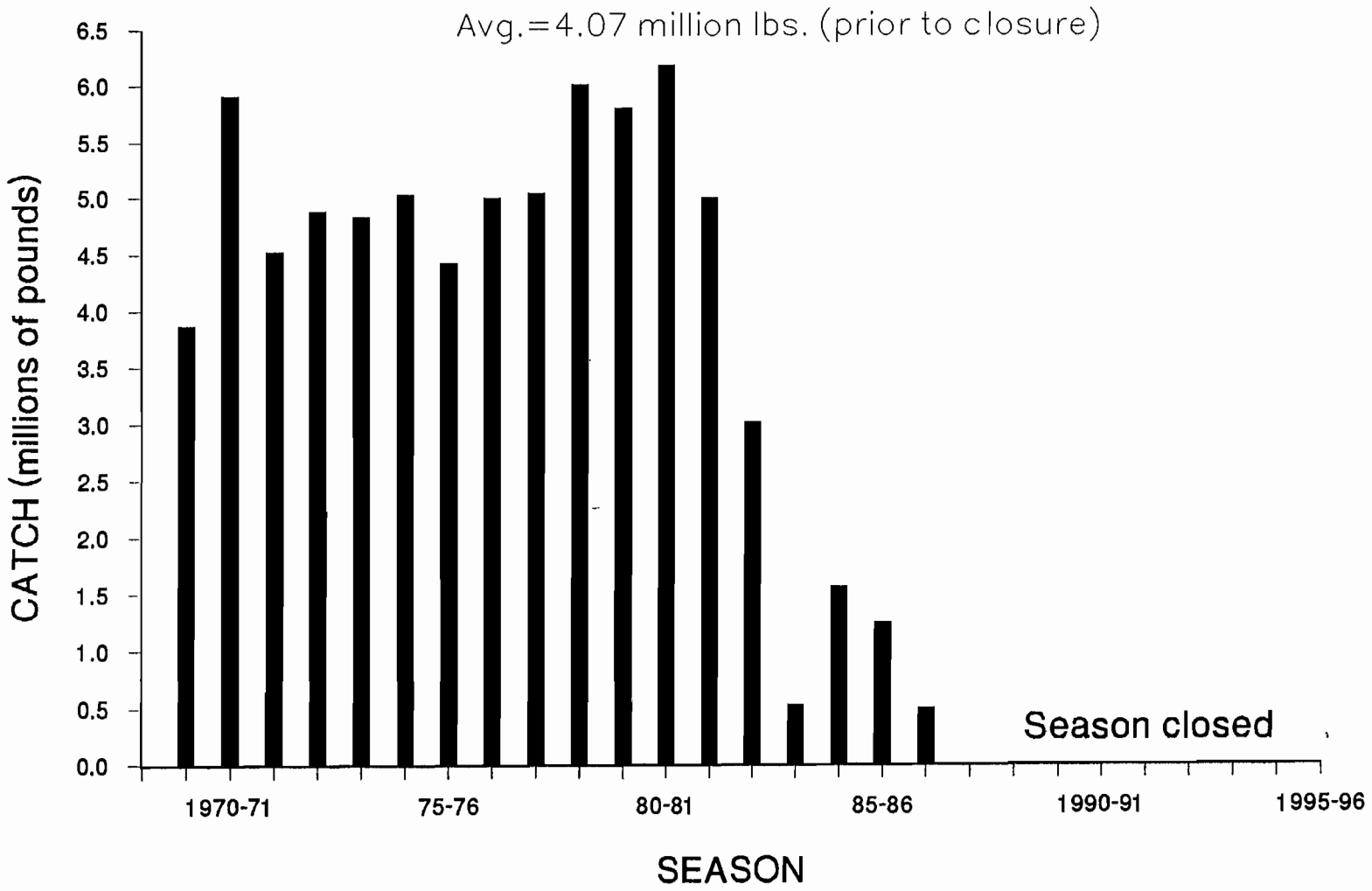

Figure 7. Trawl shrimp catch by season, Kachemak Bay, Cook Inlet Mgt. Area (H), 1969-95.

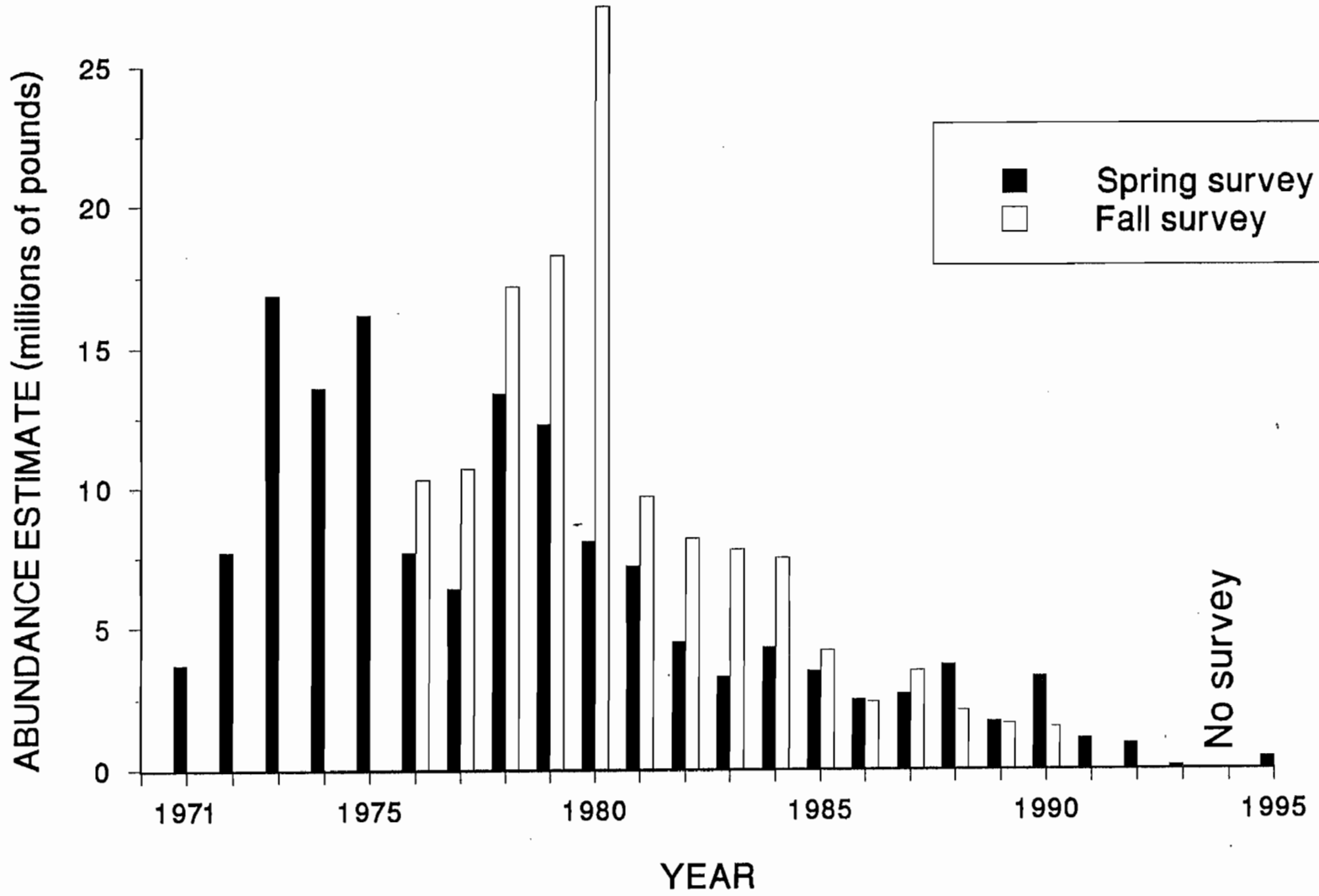

Figure 8. Pandalid shrimp population est., Kachemak Bay trawl shrimp survey, Cook Inlet Management Area, 1972-95.

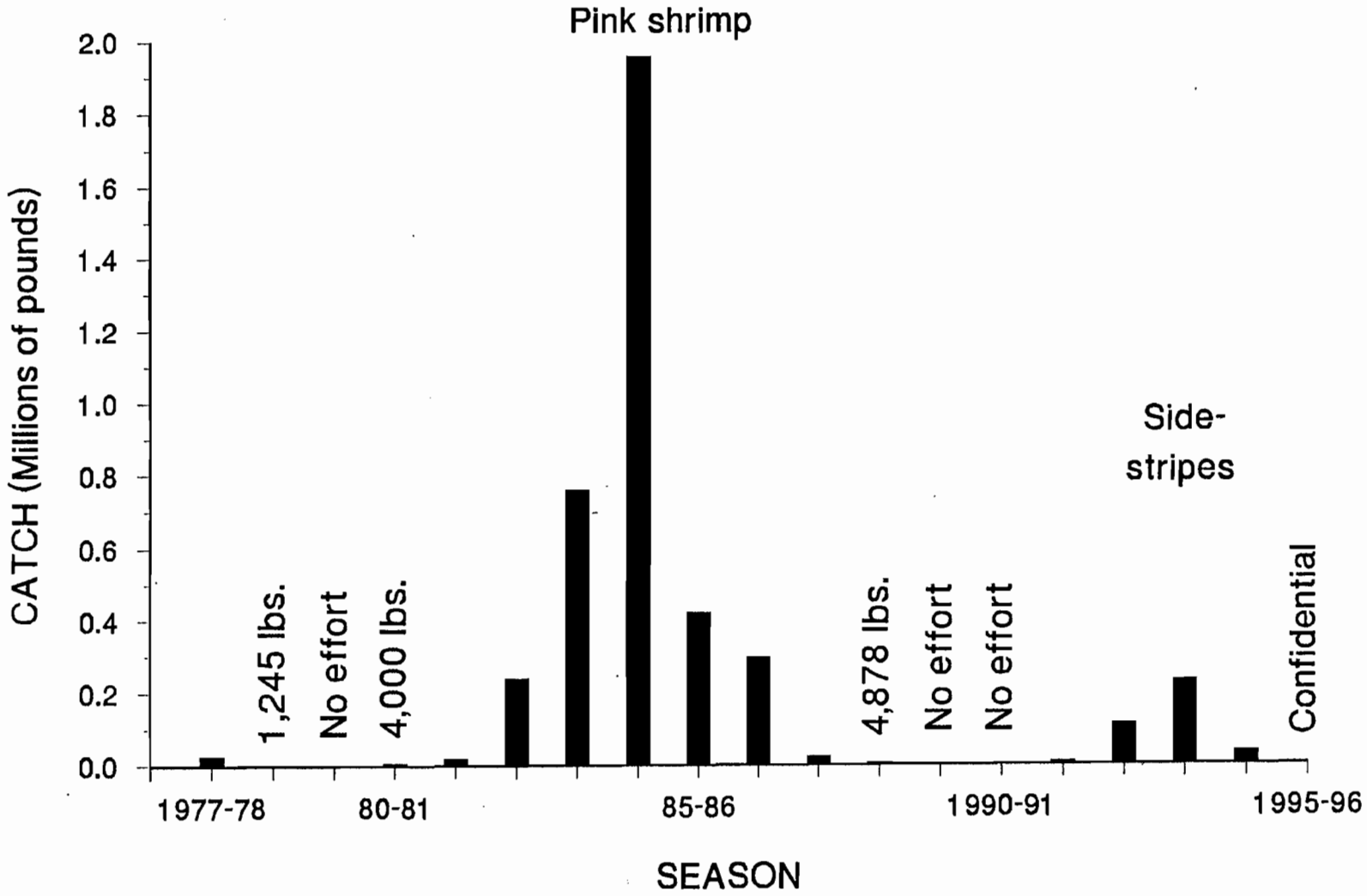

Figure 9. Trawl shrimp catch by season, Outer Cook Inlet, Cook Inlet Mgt. Area (G), 1977-1995.

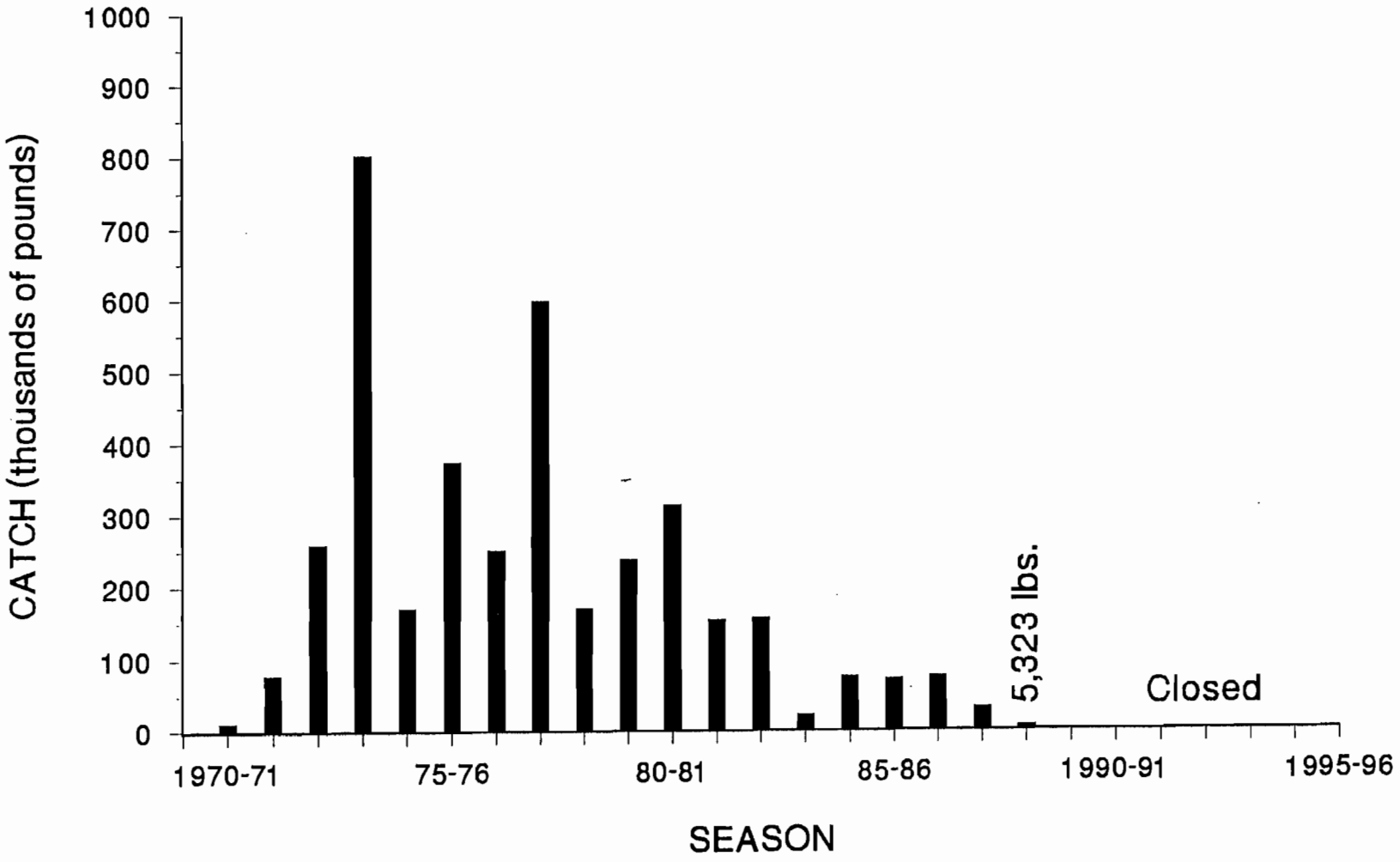

Figure 10. Pot shrimp catch by season, Kachemak Bay, Cook Inlet Mgt. Area (H) 1970-95

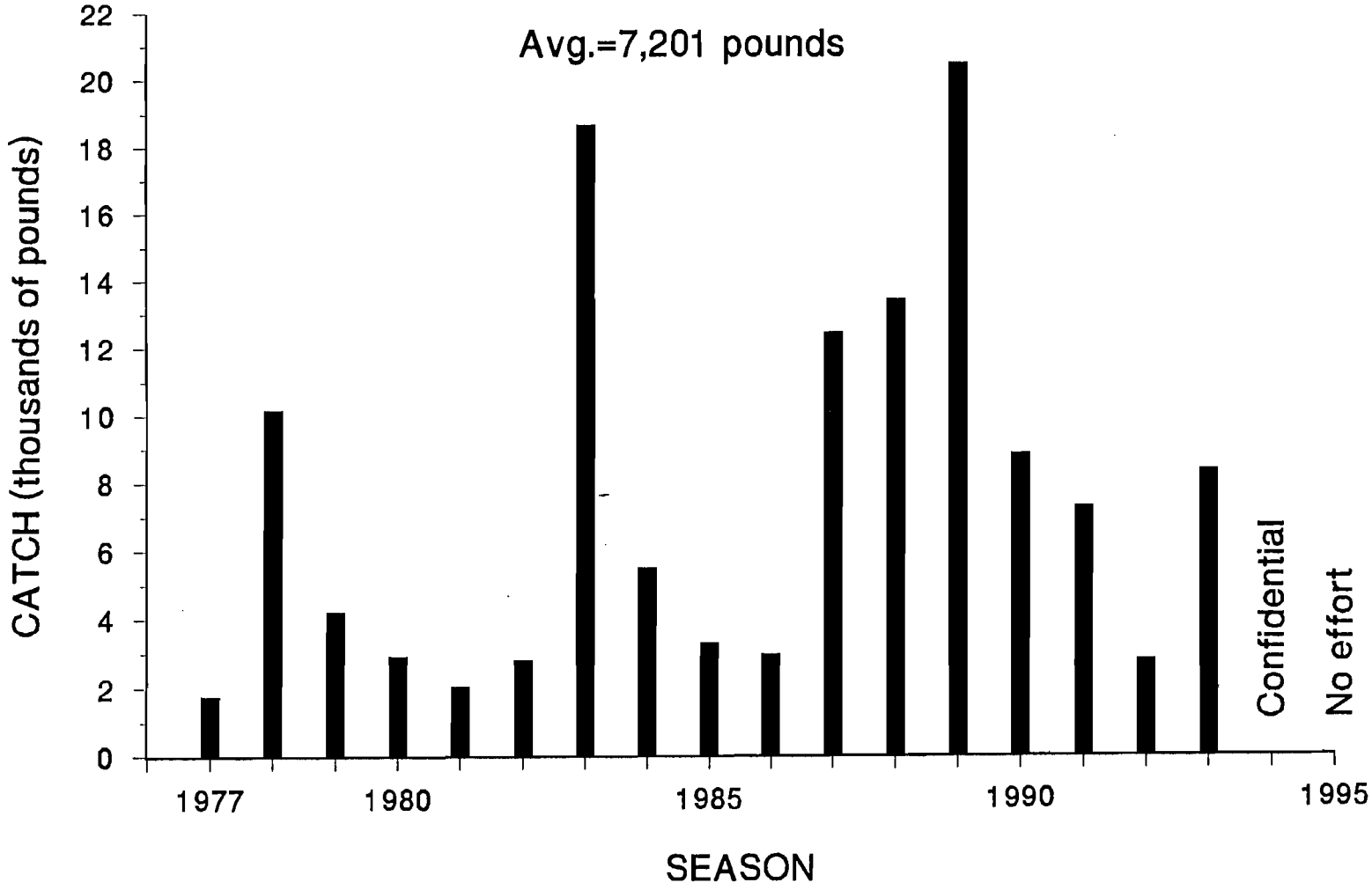

Figure 11. Pot shrimp catch by season, Outer Cook Inlet, Cook Inlet Mgt. Area (G), 1977-95.

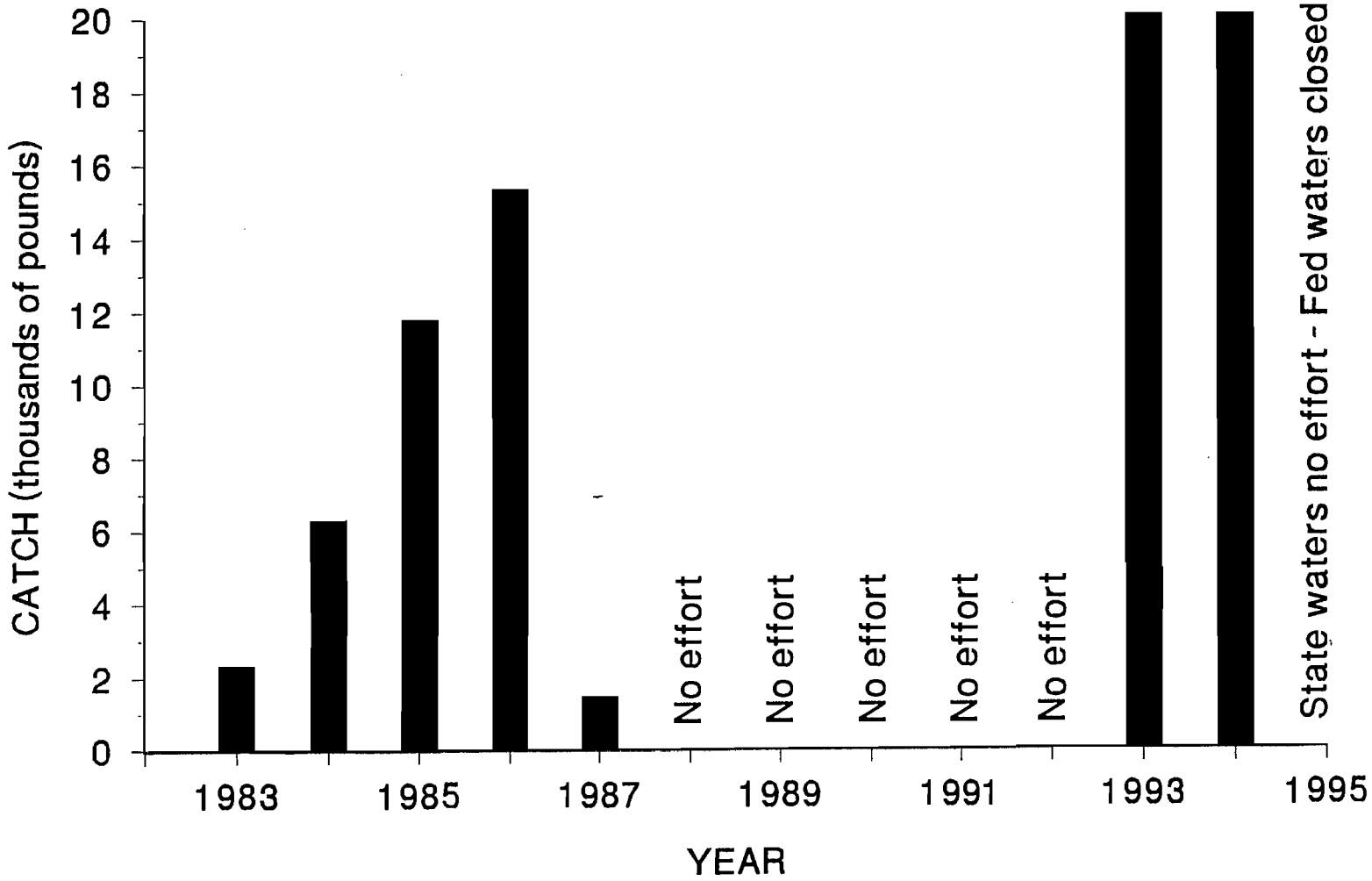

Figure 12. Weathervane scallop harvest by year, Kamishak Distr., Cook Inlet Management Area, 1983-1995.

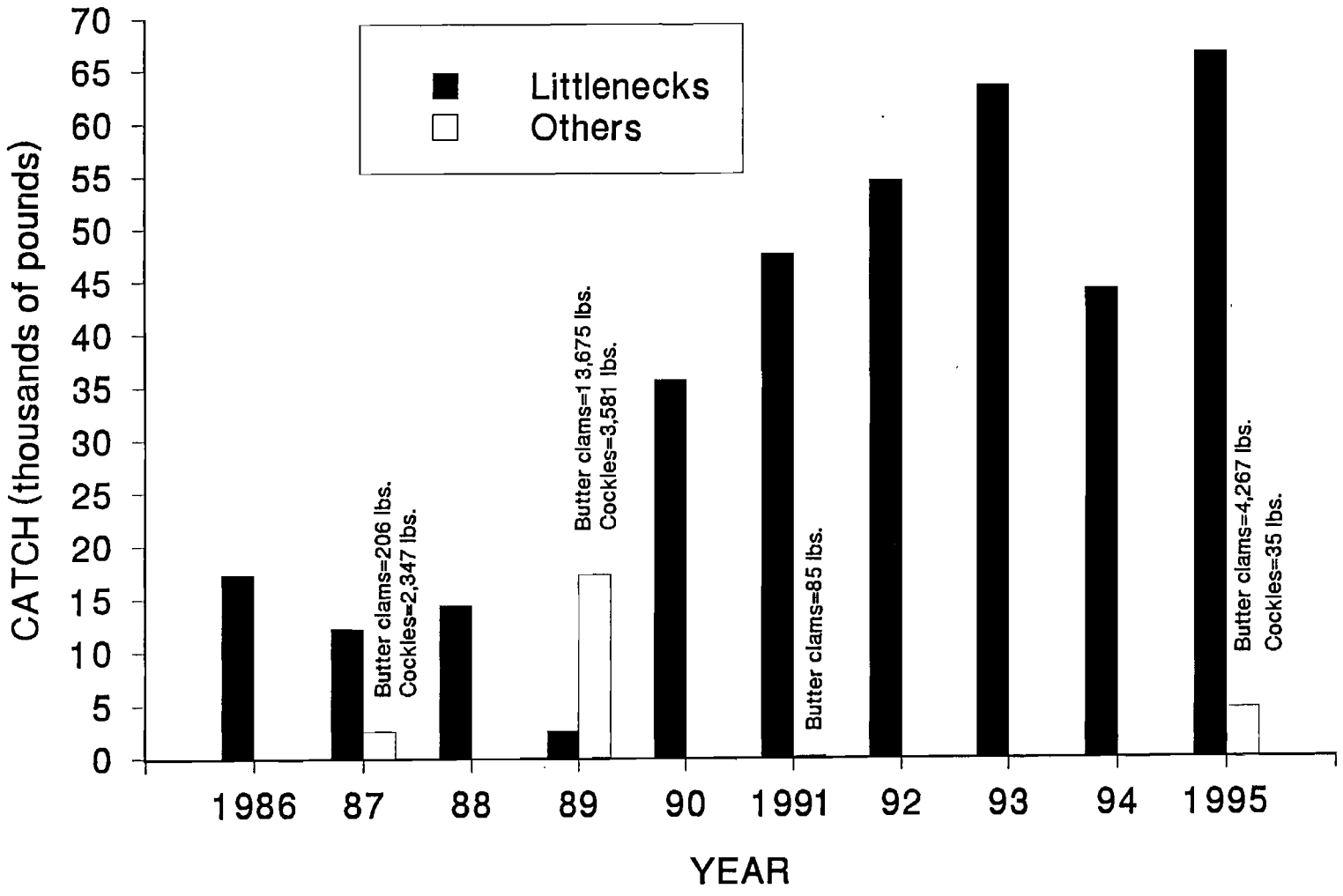

Figure 13. Hardshell clam harvest, Cook Inlet Management Area, 1986-95.

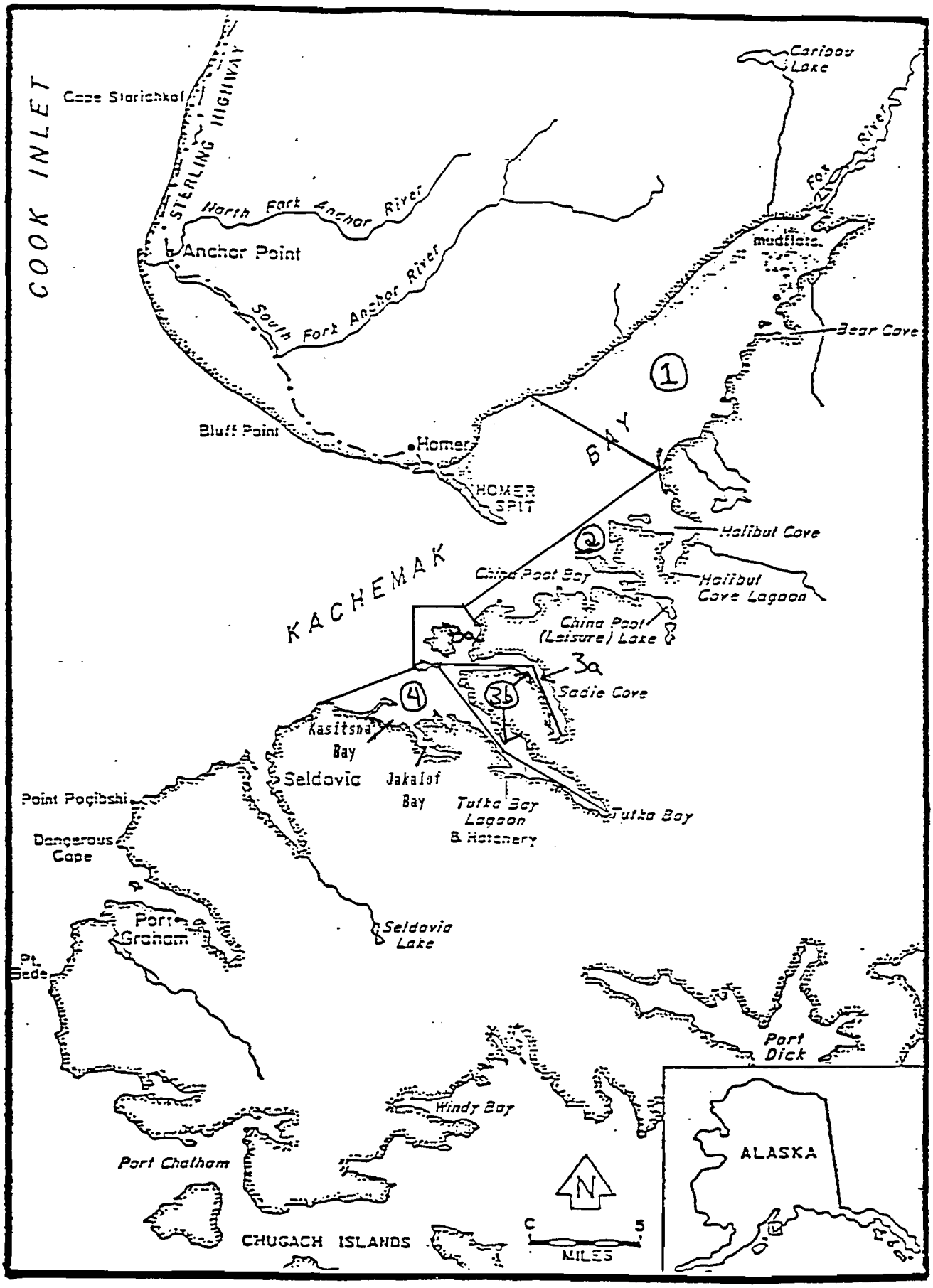

Figure 14. Southern District hardshell clam subdistricts.

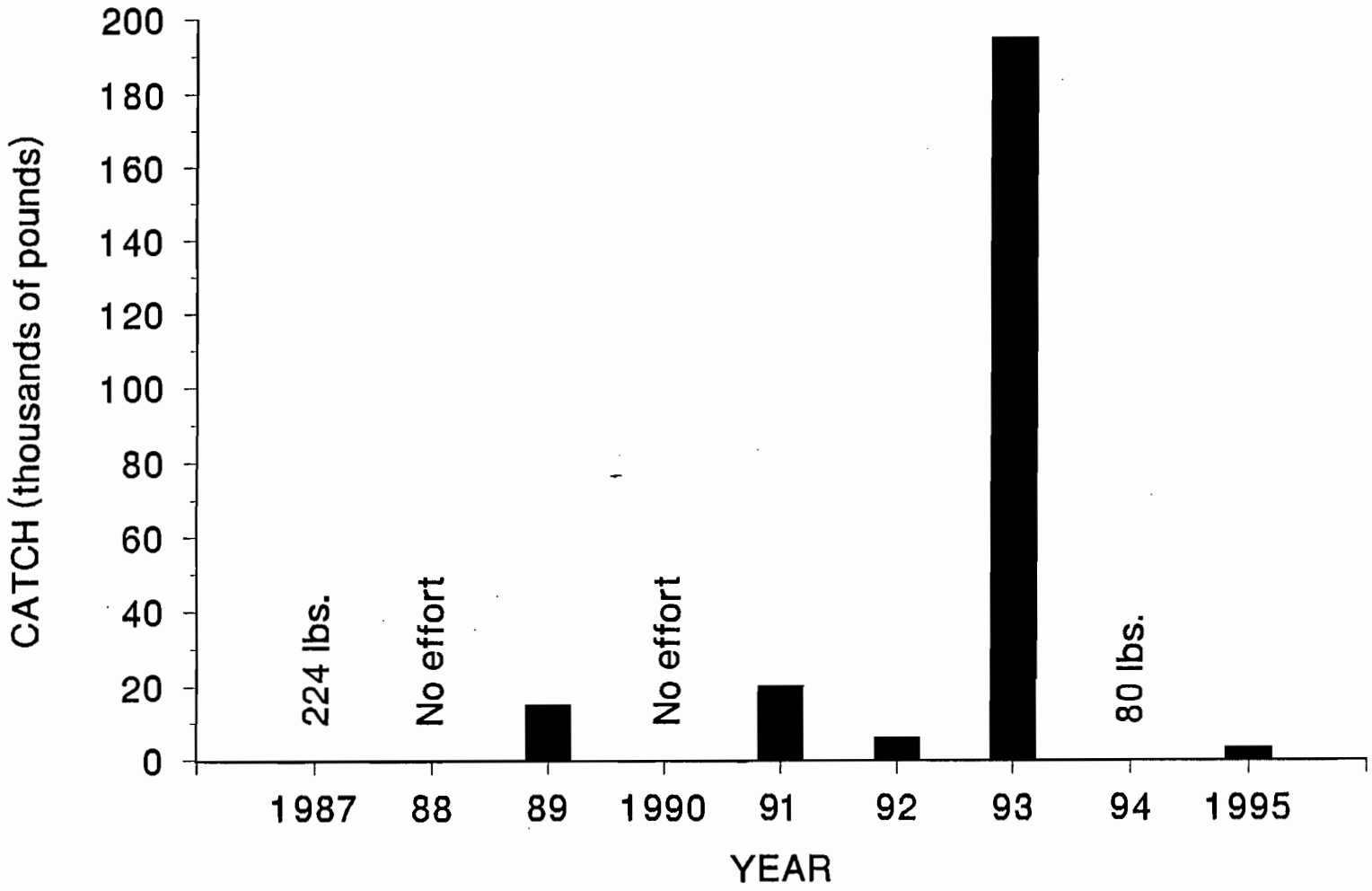

Figure 15. Green sea urchin harvest, Cook Inlet Management Area, 1987-95.

Appendix A. Tanner crab catch (pounds) by season, Cook Inlet Management Area, 1968-1996.

Season	Southern	Vessels	Kamishak/ Barren Is.	Vessels	Outer/ Eastern	Vessels	Central	Vessels	Total catch	Total vessels
1968-69	1,388,282		12,398		816				1,401,496	
1969-70	1,147,154		71,196		104,191				1,322,541	
1970-71	1,046,803		541,212		3,000				1,591,015	
1971-72	2,462,956		974,962		804,765				4,242,683	
1972-73	2,935,662		3,361,023		1,266,023				7,562,708	
1973-74	1,387,535		4,689,251		1,891,021				7,967,807	
1974-75	967,762		2,150,462		656,660				3,774,884	
1975-76	1,339,245		3,281,084	17	850,964				5,471,293	57
1976-77	2,009,633	35	1,765,926	24	824,520				4,600,079	67
1977-78	2,806,568	55	2,077,092	28	502,049				5,385,709	92
1978-79	2,323,420	75	2,713,339	27	694,728				5,731,487	77
1979-80	1,134,940	68	3,338,623	24	595,645				5,069,208	68
1980-81	1,047,630	46	1,757,331	20	463,201				3,268,162	52
1981-82	548,529	41	1,286,332	18	524,897	9			2,359,758	51
1982-83	584,908	48	1,693,794	20	682,919	20			2,961,621	65
1983-84	996,763	45	1,373,674	17	443,384	14			2,813,821	71
1984-85	1,229,298	83	1,535,547	19	259,083	7			3,023,928	86
1985-86	1,164,261	103	1,288,711	24	177,041	5			2,630,013	109
1987	1,077,379	87	1,111,339	21	251,174	13	7,771	2	2,447,663	95
1988	944,763	127	417,182	24	168,969	23	8,396	3	1,539,310	137
1989	CLOSED	--	CLOSED	--	CLOSED	--	CLOSED	--	0	--
1990	CLOSED	--	422,037	7	CLOSED	--	CLOSED	--	422,037	7
1991	271,379	68	266,106	8	CLOSED	--	CLOSED	--	537,485	71
1992	354,868	110	CLOSED	--	53,049	16	CLOSED	--	407,917	121
1993	534,003	136	CLOSED	--	CLOSED	--	CLOSED	--	534,003	136
1994	284,676	110	CLOSED	--	CLOSED	--	CLOSED	--	284,676	110
1995	CLOSED	--	CLOSED	--	CLOSED	--	CLOSED	--	CLOSED	--
1996	CLOSED	--	CLOSED	--	CLOSED	--	CLOSED	--	CLOSED	--
Average [a]	1,082,064	77	1,509,645	20	433,897	13	8,084	3	2,594,404	83

a/ Since inception of minimum legal size between the 1976-77 season. Does not include closed seasons.

Appendix B. Average weight of Tanner crabs, by district, from the commercial fishery, Cook Inlet Management Area, 1974-1996.

Season	Southern District	Kamishak/Barren Is. Districts	Outer/Eastern Districts	Central District
Prior to 1974	No data available			
1974-75	2.85	N/A	N/A	
1975-76	2.65	"	"	
1976-77	2.79	"	"	
1977-78	2.65	2.35	"	
1978-79	2.64	2.25	"	
1979-80	2.60	2.23	"	
1980-81	2.75	2.20	"	
1981-82	2.50	2.29	"	
1982-83	2.47	2.29	"	
1983-84	2.51	2.23	"	
1984-85	2.49	2.29	"	
1985-86	2.30	2.17	2.16	
1987[a]	2.31	2.26	2.23	2.33
1988	2.46	2.29	2.17	2.14
1989	CLOSED	CLOSED	CLOSED	CLOSED
1990	CLOSED	2.13	CLOSED	CLOSED
1991	2.56	2.09	CLOSED	CLOSED
1992	2.57	CLOSED	2.16	CLOSED
1993	2.54	CLOSED	CLOSED	CLOSED
1994	2.58	CLOSED	CLOSED	CLOSED
1995	CLOSED	CLOSED	CLOSED	CLOSED
1996	CLOSED	CLOSED	CLOSED	CLOSED
Average	2.57	2.24	2.19	2.24

[a] Season opened by regulation 1/15/87. Prior to 1987, the season overlapped two calendar years.

Appendix C. Tanner crab population estimates in numbers by sex, size and age classes, 1995 Cook Inlet trawl survey.

Males	Southern District	Kamishak and Barren Is. District
Sublegal		
<70 mm	372,035	47,256
70 - 91 mm	356,327	422,861
91 - 114 mm		
new	449,225	841,368
o & vo	17,330	502,175
115 - 139 mm		
new	386,004	733,399
o & vo	37,399	875,308
Legal		
140 - 164 mm		
new	157,383	171,912
o & vo	62,421	71,418
>166 mm		
new	6,049	0
o & vo	9,466	0
Total legals	235,319	243,330
Total Males	1,853,639	3,665,697
FEMALES		
Juveniles	609,577	195,451
Adults	676,352	479,970
Total Females	1,285,929	675,421

Appendix D. King crab catch (pounds) by season, Cook Inlet Management Area, 1960-1996.

Season	District: Kachemak Bay Southern	District: Kamishak/ Barren Is.	District: Outer/ Eastern	Total Catch	Number of Vessels
1960-61	2,699,680	986,551	118,067	3,804,298	
1961-62	1,619,642	3,642,500	368,909	5,631,051	
1962-63	2,769,343	5,509,708	343,505	8,616,556	
1963-64	1,960,426	4,915,303	59,352	6,935,081	
1964-65	1,892,479	1,850,572	963	3,744,014	
1965-66	1,948,012	1,684,346	14,491	3,646,849	
1966-67	1,347,904	1,386,008	89,510	2,823,422	
1967-68	1,117,394	1,883,605	239,518	3,240,520	
1968-69	750,906	1,711,296	87,302	2,549,504	
1969-70	1,464,721	1,688,803	73,644	3,227,168	
1970-71	1,540,018	2,115,991	9,468	3,665,477	
1971-72	1,992,224	2,868,315	12,657	4,873,197	
1972-73	1,391,024	2,756,023	1,966	4,149,013	
1973-74	1,971,841	2,236,131	5,613	4,213,585	
1974-75	1,816,512	2,965,310	2,035	4,783,857	
1975-76	1,674,872	1,832,484	45,293	3,552,649	
1976-77	1,035,316	3,103,895	16,384	4,155,595	
1977-78	584,090	1,099,279	1,350	1,684,719	74
1978-79	664,388	480,261	1,753	1,146,402	89
1979-80	853,584	489,365	4,871	1,347,820	82
1980-81	508,670	1,635,922	8,022	2,152,617	50
1981-82	183,899	1,371,821	4,142	1,559,863	53
1982-83	CLOSED	807,079	15,280	822,359	27
1983-84	CLOSED	188,027	4,504	192,531	17
1984-85	CLOSED	CLOSED	CLOSED	0	--
1985-86	CLOSED	CLOSED	CLOSED	0	--
1986-87	CLOSED	CLOSED	CLOSED	0	--
1987-88	CLOSED	CLOSED	CLOSED	0	--
1988-89	CLOSED	CLOSED	CLOSED	0	--
1989-90	CLOSED	CLOSED	CLOSED	0	--
1990-91	CLOSED	CLOSED	CLOSED	0	--
1991-92	CLOSED	CLOSED	CLOSED	0	--
1992-93	CLOSED	CLOSED	CLOSED	0	--
1993-94	CLOSED	CLOSED	CLOSED	0	--
1994-95	CLOSED	CLOSED	CLOSED	0	--
1995-96	CLOSED	CLOSED	CLOSED	0	--

Note: Average pre 1984-85 closure catch = 3.44 million pounds per year.

Appendix E. Dungeness crab catch (pounds) by year, Cook Inlet Management Area, 1961-1995.

Year	Southern district catch	Other districts catch	Total catch	No. of vessels	No. of landings
1961	193,683	0	193,683	12	189
1962	530,770	0	530,770	15	269
1963	1,665,599	11,605	1,677,204	50	1,360
1964	417,005	6,036	423,041	22	341
1965	74,211	0	74,211	14	105
1966	12,523	117,037	129,560	5	28
1967	7,168	0	7,168	2	13
1968	484,452	3,407	487,859	7	224
1969	49,894	0	49,894	9	41
1970	209,819	0	209,819	10	50
1971	97,161	0	97,161	22	136
1972	38,930	0	38,930	24	206
1973	308,777	1,271	310,048	54	625
1974	718,729	2,514	721,243	38	619
1975	361,893	922	362,815	34	402
1976	118,903	395	119,298	19	123
1977	74,195	510	74,705	18	94
1978	1,212,571	3,208	1,215,779	49	668
1979	2,130,963	0	2,130,963	72	1,485
1980	1,875,281	0	1,875,281	54	1,183
1981	1,850,977	0	1,850,977	88	2,047
1982	818,380	505	818,885	108	2,310
1983	746,585	834	747,419	71	1,194
1984	799,638	570	800,208	102	1,687
1985	1,389,891	12,511	1,402,402	106	1,768
1986	550,968	12,894	563,862	83	1,069
1987	761,423	21,753	783,176	100	1,377
1988	677,334	41,941	719,275	84	1,305
1989	170,266	7,798	178,064	43	455
1990	28,938	564	29,502	23	112
1991	Season closed	0	0	0	0
1992	Season closed	7,108	7,108	1	1
1993	Season closed	9,652	9,652	1	36
1994	Season closed	CONFIDENTIAL	CONFIDENTIAL		
1995	Season closed	CONFIDENTIAL	CONFIDENTIAL		

Note: Average catch 1978-1990 = 1.01 million pounds per year.

Appendix F. Dungeness commercial catch east and west of Homer Spit, Southern District, Cook Inlet Management Area, 1978-1995.

Year	East of Spit			West of Spit	
	Catch (lbs)	Vessels		Catch (lbs)	Vessels
1978	107,470	21		1,105,101	54
1979	290,829	54		1,840,134	81
1980	375,056	44		1,500,225	61
1981	1,237,694	84		613,283	65
1982	636,789	100		181,591	71
1983	463,968	62		282,617	43
1984	563,659	82		235,979	65
1985	783,607	93		606,284	60
1986	249,183	57		301,785	34
1987	291,206	67		470,217	38
1988	426,531	55		250,803	39
1989	98,215	36		72,051	15
1990	10,495	18		18,433	10
1991[a]			CLOSED		
1992			CLOSED		
1993			CLOSED		
1994			CLOSED		
1995			CLOSED		
Average	425,746	59		575,269	49

a/ 1991-95 seasons not included in average.

Appendix G. Shrimp catches (pounds) from the Kachemak Bay trawl shrimp fishery in the Cook Inlet Management Area, 1969-95.

Season	Number of vessels	Catch			
		Jun 1-Oct 31	Nov 1-Mar 31	Apr 1-May 31	Total
1969-70 [a]	7	1,289,656	1,692,854	889,330	3,871,840
1970-71 [a]	3	3,211,924	2,076,228	617,836	5,905,988
1971-72 [a]	7	2,618,630	1,761,569	140,707	4,520,906
1972-73 [a]	10	2,772,422	2,109,660		4,882,082
1973-74 [b]	13	2,502,154	2,323,780		4,825,934
1974-75	4	2,512,764	2,519,148		5,031,912
1975-76	4	1,997,563	2,421,456		4,419,019
1976-77	5	2,545,885	2,453,101		4,998,986
1977-78	7	2,490,969	2,546,977		5,037,946
1978-79	6	2,952,733	3,060,066		6,012,799
		Jul 1-Sep 30	Oct 1-Dec 31	Jan 1-Mar 31	
1979-80	7	2,013,298	2,052,646	1,731,483	5,797,427
1980-81	15	1,780,677	2,691,746	1,704,706	6,177,129
1981-82	23	1,614,868	1,686,781	1,693,850	4,995,499
1982-83	15	998,522	1,012,388	1,009,857	3,020,767
1983-84	10	CLOSED	CLOSED	525,508	525,508
1984-85	10	519,651	528,506	518,529	1,566,686
1985-86	5	488,606	257,782	503,340	1,249,728
1986-87	3	504,206	CLOSED	CLOSED	504,206
1987-88	0	CLOSED	CLOSED	CLOSED	0
1988-89	0	CLOSED	CLOSED	CLOSED	0
1989-90	0	CLOSED	CLOSED	CLOSED	0
1990-91	0	CLOSED	CLOSED	CLOSED	0
1991-92	0	CLOSED	CLOSED	CLOSED	0
1992-93	0	CLOSED	CLOSED	CLOSED	0
1993-94	0	CLOSED	CLOSED	CLOSED	0
1994-95	0	CLOSED	CLOSED	CLOSED	0
1995-96	0	CLOSED	CLOSED	CLOSED	0

a Catches listed for comparative purposes by seasons established in 1973.

b June 1- October 31 and November 1 - March 31 seasons with respective guidelines established.

Appendix H. Trawl shrimp catches (pounds) in Outer Cook Inlet (Area G), Cook Inlet Management Area, 1977-96.

Season	Number of vessels	Catch[a]
1977-78	2	26,556
1978-79	1	1,245
1979-80	0	0
1980-81	1	4,000
1981-82	2	19,454
1982-83	4	239,584
1983-84	7	760,430
1984-85	11	1,957,959
1985-86[b]	4	421,063
1986-87	2	297,762
1987-88	1	22,231
1988-89	1	4,878
1989-90	0	0
1990-91	0	0
1991-92	2	6,196
1992-93	2	111,709
1993-94	2	218,854
1994-95	3	32,591
1995-96	1	CONFIDENTIAL

a Catches from 1982-1987 were predominantly pink shrimp. Catches from 1991-1996 were mostly sidestripes.

b Regulatory season of 1 June through 28 February adopted by the Alaska Board of Fisheries in spring, 1985.

Appendix I. Pot shrimp harvest (pounds) Cook Inlet Management Area, Area H, 1970-96.

Season	Number of vessels				Total
			Jun 1-Sep 30	Oct 1-May 31	
1970-71			3,606	7,602	11,208
1971-72			8,836	70,601	79,437
1972-73			75,247	184,230	259,477
1973-74			63,181	738,165	801,346
1974-75			43,650	126,472	170,122
1975-76			100,765	273,758	374,523
1976-77	26		52,115	199,559	251,674
1977-78	51		85,511	511,938	597,449
1978-79	41		49,080	121,234	170,314
1979-80	49		59,963	177,927	237,890
		Jun 1-Sep 15	Nov 1-Dec 31	Feb 1-Mar 31	
1980-81	30	74,368	134,275	104,716	313,359
1981-82	45	56,092	47,859	49,885	153,836
1982-83	40	54,153	49,130	52,339	155,622
1983-84	15	21,438	CLOSED	CLOSED	21,438
1984-85	22	25,874	28,151	22,080	76,105
		Jun 1-Sep 15	Oct 1-Dec 31	Feb 1-Mar 31	
1985-86	25	27,312	20,737	24,048	72,097
1986-87	37	24,844	20,188	30,257	75,289
1987-88	30	26,216	5,416	CLOSED	31,632
1988-89	9	5,323	CLOSED	CLOSED	5,323
1989-90		CLOSED	CLOSED	CLOSED	0
1990-91		CLOSED	CLOSED	CLOSED	0
1991-92		CLOSED	CLOSED	CLOSED	0
1992-93		CLOSED	CLOSED	CLOSED	0
1993-94		CLOSED	CLOSED	CLOSED	0
1994-95		CLOSED	CLOSED	CLOSED	0
1995-96		CLOSED	CLOSED	CLOSED	0

Closures have been for those waters of the Southern District east of a line from Anchor Point to Point Pogibshi only.

Appendix J. Pot shrimp catch (pounds) and effort in Outer Cook Inlet (Area G), Cook Inlet Management Area, 1977-95.

Season	Number of vessels	Catch
1977	6	1,776
1978	11	10,157
1979	5	4,211
1980	3	2,911
1981	5	2,031
1982	7	2,805
1983	13	18,679
1984	5	5,504
1985	6	3,305
1986	4	2,967
1987	9	12,458
1988	7	13,445
1989[a]	8	20,500
1990	5	8,853
1991	8	7,315
1992	3	2,804
1993	3	8,356
1994	1	CONFIDENTIAL 1,536
1995	0	0
96	2	1,609
	Average =	7,115

a/ Season closed from April 30 through July 7 due to Exxon Valdez oil spill.

has rigid mesh requirement identical to PWS

Appendix K. Pacific weathervane scallop catches, Cook Inlet Management Area., 1983-95.

Year	District	Number of vessels	Catch in pounds of shucked meats
1983	Kamishak	1	2,346
1984	Kamishak	3	6,305
1985[a]	Kamishak	1	11,810
1986	Kamishak	3	15,364
1987	Outer Kamishak[b]	1	1,128
		2	360
	'87 Total	2	1,488
1988		NO EFFORT	
1989		NO EFFORT	
1990		NO EFFORT	
1991		NO EFFORT	
1992		NO EFFORT	
1993	Kamishak	3	20,115
1994	Kamishak	4	20,431
1995[c]	Kamishak	0	0

a/ Season and harvest guideline set by regulation.

b/ Season closed by E.O. on August 21, 1987, one week after opening, due to low cpue.

c/ State waters open only.

Appendix L. Harvest (pounds) of hardshell clams, Cook Inlet Management Area, 1986-95.

Year	No. of permits	No. of landings	Pacific little necks	Butter clams	Cockles	Total
1986	5	18	17,303	0	0	17,303
1987	8	69	12,214	206	2,347	14,767
1988	2	32	14,449	0	0	14,449
1989	9	41	2,584	13,675 [a]	3,581[b]	19,840
1990	19	62	35,744	0	0	35,744
1991	19	78	47,486	85	0	47,571
1992	21	117	54,631	0	0	54,631
1993	33	159	63,676	0	0	63,676
1994	32	104	44,291	0	0	44,291
1995	21	93	66,723	4,267	35	71,025

a/ Includes 13,348 pounds sold as otter food as a result of Exxon Valdez oil spill.

b/ Includes 1,981 pounds sold as otter food as a result of Exxon Valdez oil spill.

Appendix M. Harvest (pounds) of blue mussels, Cook Inlet Management Area, 1986-95.

Year	No. of permits	No. of landings	Total
1986	0	0	0
1987	1	2	102
1988	0	0	0
1989	9	98	167,243 [a]
1990	2	10	10,600
1991	3	11	16,485
1992	3	11	2,501
1993	2	4	1,083
1994	2	3	570
1995	1		CONFIDENTIAL

[a/] Includes 165,268 pounds sold as otter food as a result of Exxon Valdez oil spill.

Appendix N. Green sea urchin harvest (pounds), Cook Inlet Management Area, 1987-95.

Year	No. of divers	Total
1987	1	224
1988	NO EFFORT	
1989	1	15,181
1990	NO EFFORT	
1991	4	20,445
1992	7	6,119
1993	29	195,403
1994	2	80
1995	9	3,295

Appendix O. Sea cucumber catch (pounds) by permit season, Cook Inlet Management Area, 1990-96.

Permit season	No. divers	No. landings	Total
1990	2	14	22,525
1991		N O C A T C H[b]	
1992		N O C A T C H[b]	
1993-94[a]	16	40	30,940
1994-95[a]	22	93	26,575
1995-96		N O C A T C H[b]	

a/ Permit season established 10/1 - 4/30.

b/ Divers did not find commercial quantities of sea cucumbers.

Appendix P. Octopus harvest (pounds) in the Cook Inlet Management Area (H) 1983-95.

Year	No. of vessels	No. of landings	Total
1983	41	101	32,841[a]
1984	36	77	46,698[a]
1985	40	70	48,067[a]
1986	8	16	435
1987	21	57	4,512
1988	17	43	5,569
1989		NO REPORTED LANDINGS	
1990	3	6	1,343
1991	8	21	2,088
1992		NO DIRECTED FISHERY	
1993[b]	3	6	475
1994[b]	3	9	1,064
1995[b]	6	12	1,594

a/ Bycatch from shellfish pot fisheries.

b/ Directed fishery catch and effort only.

6-20,000
since 92
Fed fishery
P. Cod 97

Appendix Q. Harvest of razor clams Cook Inlet Management Area, 1919-1995.

Year	Pounds	Year	Pounds
1919	76,963	1960	372,872
1920	11,952	1961	277,830
1921	72,000	1962	195,650
1922	510,432	1963	0
1923	470,280	1964	0
1924	156,768	1965	0
1925	0	1966	0
1926	0	1967	0
1927	25,248	1968	0
1928	0	1969	0
1929	0	1970	0
1930	0	1971	14,755
1931	No record	1972	31,360
1932	93,840	1973	34,415
1933	No record	1974	No record
1934	No record	1975	10,020
1935	No record	1976	No record
1936	No record	1977	1,762
1937	8,328	1978	45,931
1938	No record	1979	144,358
1939	No record	1980	140,240
1940	No record	1981	441,949
1941	0	1982	460,639
1942	0	1983	269,618
1943	0	1984	261,742
1944	0	1985	302,934
1945	15,000	1986	258,632
1946	11,424	1987	312,349
1947	11,976	1988	392,610
1948	2,160	1989	222,747
1949	9,672	1990	323,533
1950	304,073	1991	201,320
1951	112,320	1992	296,727
1952	0	1993	310,289
1953	0	1994	355,165
1954	0	1995	248,358
1955	0		
1956	0		
1957	0		
1958	0		
1959	0		